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# THE QUESTION OF THE NECESSITY OF A SECOND OPERATION FOR THE REMOVAL OF THE APPENDIX IN CASES WHERE AN APPENDICEAL ABSCESS HAS BEEN TREATED BY SIMPLE INCISION AND DRAINAGE

BY STUART M'GUIRE, M. D.,
(Surgeon in Charge of St. Luke's Hospital, Richmond, Va.)

In November, 1907, I read a paper before the Medical Society of Virginia entitled "An Analysis of the Last Five Hundred Cases of Appendicitis Operated on at St. Luke's Hospital." In this list of cases there were 93 appendiceal abscesses. In 70 cases the abscesses were not adherent to the abdominal wall, but were between the folds of the bowel and omentum, in a position they could only be reached after opening the general peritoneal cavity. In all these cases the adhesions were separated, the pus sponged out, and the appendix sought for and removed. In 23 cases the abscesses were adherent to the parietal peritonium, and they were simply incised and drained. In speaking of this last group of cases, I said:

"If an abscess is adherent to the parietal peritonium, it should simply be opened and drained, and no effort made to locate or remove the diseased appendix. With all due deference to those who do not agree with me, I consider it a surgical crime to break up the protecting wall formed by Nature and to liberate infectious fluid into the peritoneal cavity, when a safe exit may be given the pus by simply following the indications of Nature and making an incision at the point where she is endeavoring to effect drainage. * * * The safety of the plan advocated is shown by the fact that of the twenty-three cases reported there were no deaths. In every instance the patients were told that the operation was not for appendicitis, but for an abscess which was the result of appendicitis, and that the appendix had not been removed. They were warned of the possibility of future trouble, and were advised to apply promptly for surgical relief if in future they suffered from abdominal pain."

The views expressed in the foregoing paragraph caused considerable discussion on (*a*) the advisability of leaving the appendix at the first operation; and (*b*) the necessity for its removal by a second operation. I will not in this paper take up the first question, as I believe it is pretty well settled, but I will devote the time at my disposal to a consideration of the second, as there seems to be a difference of opinion as to whether a secondary operation ought to be done on every case as a routine measure, or confined to the few cases where it is plainly necessary owing to recurrence of symptoms.

To reach conclusions I have pursued two methods of investigation. First, I have written to a number of surgeons to inquire the rule they follow; and second, I have written to the twenty-three patients whose cases I reported to ascertain their subsequent history. The following are the replies received from the surgeons. A few did not answer my question definitely, probably due to the fact that it was not worded explicitly. Some have answered at such length that their opinion has to be given in abridged form.

Dr. Dudley P. Allen of Cleveland writes that he has simply drained in a large number of cases of appendicular abscess, and in the majority of them the cure has been permanent. It is not his habit to make a secondary operation unless there is a recurrence of symptoms. He cannot say definitely what percentage requires a secondary operation, but it is certainly very small.

Dr. Arthur D. Bevan of Chicago writes that in many cases he has found it necessary to do a second operation to remove the appendix where the primary operation was that of draining an abscess. This has occurred so frequently (in perhaps 50 per cent of his cases) that he now advises all patients upon whom he operates to drain an abscess to have the appendix removed at a second operation.

Dr. Herman Bolt of New York apparently does not advise an operation unless called for by symptoms. He writes: "It is my opinion that if an appendix does not undergo atrophic changes after an appendiceal abscess, so that it becomes innocuous, it is likely to cause symptoms at a subsequent time. At the first evidence of appendicular inflammation showing that the appendix is still inflamed, it should be removed.

Dr. G. E. Brewer of New York writes he does not fail to remove the appendix in over 2 per cent of his operations. In these cases he advises its removal at a later period. He has seen a number of cases, however, in which the patient has had no trouble.

Dr. Joseph D. Bryant of New York writes that he is disposed to believe that the causes of abscess should be removed in all instances when practicable.

Dr. George W. Crile of Cleveland writes that in cases of acute appendicitis, with abscess, when he does not remove the appendix at the time, he gives the patient to understand that the operation will be done in two stages. After the wound of the first operation is healed he operates a second time, removing the appendix and suturing in layers to prevent hernia.

Dr. Daniel N. Eisendrath of Chicago believes that it is a safer plan, whenever possible, to search for and remove the appendix at the primary operation unless this involves the breaking down of important lesions. When the appendix is not removed he does not believe there will be subsequent trouble in more than one per cent of cases.

Dr. Ellsworth Elliot, Jr., of New York advises a secondary operation for the removal of the appendix if symptoms of subsequent trouble develop after primary evacuation of an abscess. He believes if the primary operation is not done early the appendix is eventually a slough in many cases, coming away with the evacuation of the pus, or subsequently in the discharge, and gives no further trouble.

Dr. John F. Erdman of New York writes that when, on account of the precarious condition of the patient, he fails to remove the appendix, he advises a second operation within a relatively short time, and if they refuse to submit to it he tries to impress them with the necessity of watching for trouble.

Dr. J. M. T. Finney of Baltimore writes that in cases of abscess treated by simple incision and drainage, he earnestly advises a secondary operation for the removal of the appendix. He was forced to this opinion by seeing three cases of death during secondary attacks of appendicitis after an appendiceal abscess had been drained and the appendix left in.

Dr. John H. Gibbon of Philadelphia writes that he rarely fails to remove the appendix. At the same time, he thinks it a mistake to lay down a rule in regard to the subject, for what would be a good rule for one operator would be a bad one for another. If the appendix has been left in, he thinks it advisable to remove it later.

Dr. W. D. Haggard of Nashville states that out of 21 ancient appendiceal abscesses (10 days to 4 weeks' standing), most of which were adherent to the parieties, and which he opened and drained without searching for and removing the appendix, he had to reoperate but four times; in a girl of eight the abscess recurred and was drained three times before removal. In an elderly man a sinus persisted for 14 weeks, and when the appendix was removed it contained a cherry stone-sized enterolith. The third, in a man of 36, had two recurrent attacks, and when operated the appendix was adherent by its tip to the abdominal wall at the site of the drainage aperture. The fourth, in a woman of 29, continued to give trouble—tenderness and soreness with some disability—and was found adherent and subacutely inflamed eight months after the first operation. He admonished the others of the wisdom of a secondary operation, but they all deferred it with the promise to have it removed if they had further trouble. Where the abscess is not adherent to the abdominal wall, he always removes the appendix.

Dr. R. H. Hart of Philadelphia thinks that an appendiceal abscess should be simply opened and drained, for if a persistent attempt is made to remove the appendix there are apt to be disastrous results. If the appendix subsequently gives trouble, it should be removed by a secondary operation.

Dr. George Ben Johnston of Richmond, Va., states that it is his practice to open appendiceal abscesses, drain them, and not attempt to remove the appendix in the presence of pus. In his experience hernia usually follows, and he invariably advises a secondary operation for the removal of the damaged appendix and the repair of the hernia if it exists.

Dr. Howard Lilenthal of New York apparently does not advise a secondary operation unless symptoms develop. He writes: "When sinuses or fistulæ persist, incise the tract and remove the appendix or its remnant. When there are persistent symptoms pointing to appendicitis, following healing of a drained abscess, perform secondary appendectomy."

Dr. W. J. Mayo of Rochester, Minn., writes that, as far as possible, he recommends and practices the removal of the appendix at the time of the primary operation. When, for any reason, this is not done, he advises a secondary operation in all cases, as he believes that 25 per cent or more of patients will suffer serious symptoms if the appendix is not removed.

Dr. Edward Martin of Philadelphia writes that he has so habitually taken out the appendix for all conditions that he has had no personal experience in the removal of the organ at a secondary operation.

Dr. E. Denegre Martin of New Orleans writes that he has always contended that just as long as a diseased appendix remains in the abdominal cavity it is a menace to life, and liable to explode when least expected and often when most inconvenient. His personal experience has been such as to emphasize the importance of a secondary operation in every instance.

Dr. Rudolph Matas of New Orleans writes that he is convinced that if an appendix has been sufficiently damaged to cause an abscess requiring drainage, that sooner or later it will cause a repetition of suppuration. As a general rule, he advises a secondary operation to protect the patient from future trouble, but in a few instances, where the individual is aged, infirm or suffering from constitutional disease, he waits until the operation is indicated by recurrence of symptoms.

Dr. Willy Meyer of New York states that he believes it wise to search for and remove

the appendix when operating for perityphlitic abscesses, provided the condition of the patient warrants such interference. For many years he simply drained such cases, and not more than from 5 to 10 per cent of patients had trouble later on. In the exceptional instances the symptoms were usually due to fecal concretions within or outside the appendix, which had not been removed.

Dr. J. B. Murphy of Chicago says that he has had to reoperate on a large number of recurrent cases that had already been drained for abscess. The percentage has been sufficiently large for him to say to all patients operated on and drained that they should come back and have the appendix removed as soon as they have recovered from the suppuration.

Dr. A. J. Ochsner of Chicago states that he has had so many serious recurrences in this class of cases that he now makes it a rule to always advise a secondary operation. Moreover, he forbids these patients taking any form of nourishment except liquids, mush and soft boiled eggs, until they have the appendix removed.

Dr. Roswell Park of Buffalo writes that he hardly ever advises a secondary operation to remove the appendix which was not hunted up and removed when an abscess was drained, unless it seems to be producing occasional or persistent, even though mild, symptoms of discomfort—that is, "so long as it remains innocent and inoffensive, I do not feel like disturbing it, but when it growls I would urge its removal."

Dr. Joseph Price of Philadelphia writes that he holds hard and fast to early and complete work, a nil mortality hinging upon both; that diagnosis and surgery should be applied in cases of appendicitis before the abscess develops, and the condition ought never to occur; that he neither approves nor practices simple incision, as when perforation or gangrene exists it favors all sorts of septic and mechanical complications.

Dr. Joseph Ransohoff of Cincinnati writes that after looking over his cases he finds only three in which a secondary operation was necessary after incision and drainage of an appendiceal abscess. These cases recovered.

Dr. W. L. Rodman of Philadelphia writes that he does not remove the appendix at the first operation in more than one-third of his abscess cases. He drains with iodoform gauze, using a fan-shaped piece internally to protect the general cavity. The gauze is left in from five to eight days. Usually the wound is left open and the peritoneum is sutured to the skin with catgut to prevent its retraction. As soon as active suppuration ceases he removes the appendix and closes the wound. He believes, however, that if the appendix is not removed but a small percentage of patients would have symptoms, as the suppurative process usually puts the appendix out of commission.

Dr. John A. Wyeth of New York writes that where there is an abscess of large size he drains it through the smallest possible incision. After recovery he does not advise a radical operation for the removal of the appendix, unless, after an interval, symptoms of recurring appendicitis are present. In a fair proportion of cases there is no recurrence, and when a patient is advised to undergo a radical operation upon the first appearance of recurrent symptoms, he considers that the surgeon has performed his full duty.

So much for the opinions of the surgeons. Now for the histories of the patients. I have taken the group of twenty-three cases reported in my article read before my State society, the earliest operated on five years ago, the last one year ago, selecting them because none was so old as to have developed intercurrent diseases, and none so recent as to have escaped the possibility of complications arising from the operation. Of these twenty-three cases I was able to trace all but one. This was a small boy whose parents have moved and could not be located.

BRIEF HISTORY OF CASES.

Case 1. Boy, aged 12; ill two weeks. Large abscess opened and drained; appendix not removed. He reports that he has had no subsequent symptoms. He has no hernia and his general health is perfect.

Case 2. Man, aged 22; ill ten days. Large abscess opened and drained; appendix not removed. Reports that he has no hernia, has had no colic, does not suffer from constipation or indigestion, and that his health is better now than it was before the operation.

Case 3. Boy, aged 14; ill four weeks. Large abscess opened and drained; appendix not removed. He has had no hernia, health is excellent, and has not consulted a doctor since he left the hospital.

Case 4. Man, aged 46; ill two weeks. Large abscess opened and drained; appendix not removed. He has a slight hernia, no digestive symptoms, and his general health is good.

Case 5. Man, aged 32; ill ten days. Abscess incised and drained; appendix not removed. He reports that he suffers a little from constipation, has no hernia, and general health is excellent.

Case 6. Boy, aged 14; ill twelve days. Large abscess opened and drained; appendix not removed. He has no hernia, digestion is good, and has not suffered pain since the operation.

Case 7. Man, aged 24; ill seven days. Large abscess opened and drained; appendix not removed. He has no hernia, digestion is good, and he has recently been passed for life insurance.

Case 8. Man, aged 33; ill ten days. Large abscess opened and drained; appendix not removed. He has no hernia, does not suffer from constipation or indigestion, and has not lost a day from work in the last two years.

Case 9. Boy, aged 17; ill nine days. Large abscess opened and drained; appendix not removed. He has a slight hernia, does not suffer from dyspepsia, and his health is good.

Case 10. Boy, aged 9; ill six days. Abscess opened and drained; appendix not removed. He has no hernia, does not suffer with indigestion, and his present health is good.

Case 11. Girl, aged 8; ill ten days. Abscess opened and drained; appendix not removed. Her mother reports that "she had a small hernia, but it is now closed." She has had no constipation or dyspepsia, and is in better health than at any time during her life.

Case 12. Woman, aged 19; ill four weeks. Large abscess opened and drained; appendix not removed. She has no hernia, and is as well now as before the attack of appendicitis.

Case 13. Woman, aged 24; ill four weeks. Large abscess opened and drained; appendix not removed. She has no hernia, her digestion is good, and her general health is excellent.

Case 14. Man, aged 26; ill two weeks. Abscess opened and drained; appendix not removed. He has no hernia, his digestion is perfect and his general health is good.

Case 15. Boy, aged 10; ill two weeks. Large abscess opened and drained; appendix not removed. He has no hernia, his digestion is good; he has been free from abdominal pain, and his general health is perfect.

Case 16. Man, aged 39; ill two weeks. Large abscess opened and drained; appendix not removed. He has no hernia, does not suffer from constipation, has had no pain, and has not lost an hour from sickness since leaving the hospital.

Case 17. Man, aged 62; ill four weeks. Large abscess opened and drained; appendix not removed. He has no hernia, his digestion is good, does not suffer from constipation, has had no pain, and his health is very good considering his age.

Case 18. Man, aged 31; ill three weeks.

Large abscess opened and drained; appendix not removed. He reports that he has no hernia; that he has not had colicky pains, but he suffers a great deal from constipation and indigestion, and that his physician has recently advised him to come back and have the appendix removed.

Case 19. Woman, aged 36; ill five days. Abscess opened and drained; appendix not removed. Reports that she has no hernia, but her digestion is bad, and she has had two acute attacks of abdominal pain, and fears it will be necessary to have another operation performed.

Case 20. Man, aged 24; ill eight days. Large abscess opened and drained; appendix not removed. He has no hernia, has been free from pain, suffers some with constipation, and, except for boils, his general health is good.

Case 21. Boy, aged 16; ill six days. Abscess opened and drained; appendix not removed. Reports that he had a severe attack of pain after leaving the hospital; that the wound opened and discharged for two or three days and then healed. The incision is now closed; he has no hernia, his digestion is good, and his general health excellent.

Case 22. Girl, aged 8; ill five days. Abscess opened and drained; appendix not removed. Her mother reports that she has no hernia, does not suffer from colicky pains, digestion is good, and that her general health is better since being operated on than it had been for a long time.

An analysis of these cases will show that all the patients are living from one to five years after the operation; that none has been operated on a second time; that all, with possibly one exception, are in good general health; that only two have had attacks of colicky pains; that two have a slight hernia, and that two suffer with digestive disturbances.

The result of my study of the opinion of the various surgeons quoted and of the case histories of the number of cases collected is, that while a surgeon may be justified in advising a secondary operation in all cases as theoretically the safest plan to follow, he is not justified in persuading, urging or starving a patient until he consents to have it done. The appendix should always be removed at the first operation if the abscess is small and not adherent to the abdominal wall beneath the incision. It should be left only in neglected cases, where the abscess is large and attached to the parietal peritoneum. When this condition exists the appendix is usually gangrenous, undergoes liquefaction, and is eliminated with the discharges. In such cases suppuration continues, as a rule, for several weeks, and before a secondary operation could safely be done the patient is homesick, weakened physically by confinement, and depleted financially by the expenses incident to his stay in the hospital. Experience seems to show that if subsequent trouble develops the infection is not usually acute, and pus, if it is formed, is walled in by old adhesions. Therefore, I think that the surgeon does his duty if he makes it clear to the patient that, owing to the complications which existed, it was not found safe to remove the appendix, and tells him that while a second operation is advisable, it is not imperative unless he has tenderness over the incision, colicky pains in the bowels or persistent digestive disturbances, in any of which instances it is distinctly necessary for him to promptly seek surgical assistance.

# TUBERCULOSIS OF THE STOMACH, LIVER, GALL BLADDER, AND PANCREAS.*

BY LUCIUS W. HOTCHKISS, M.D., NEW YORK CITY.

Until very recent years the study of tuberculosis of the abdominal viscera has remained almost entirely within the domain of the pathologist. During the last twenty years, however, and more especially within the last decade, the surgeon's knife has brought under inspection during life, various lesions hitherto undescribed, and has caused the symptomatology, pathology, diagnosis and treatment of abdominal tuberculosis to be placed upon the basis of observed facts and conditions.

In the case of tuberculosis of the gall bladder and of the pancreas, there is but little of surgical interest and importance, and, until a symptomatology can be established, which may serve as a rational basis for diagnosis in these exceedingly rare conditions, they will remain, as at present, among the pathological curiosities.

In the case of the stomach and liver, however, tuberculosis may occasionally assume a form capable of being diagnosticated, and one in which surgical measures may be more or less effective.

In a paper of this sort, only the surgical bearings of gastric, hepatic and pancreatic tuberculosis, will be considered at any length, as an elaborate discussion of the pathology would be manifestly out of place and far transcend the prescribed limits.

## TUBERCULOSIS OF THE STOMACH.

This, in the vast majority of cases is secondary to and complicated by a pre-existing lung tuberculosis, and not infrequently also is associated with intestinal tuberculosis more or less extensive.

In 1886, Joseph Coats first discovered the tubercle bacillus in a gastric ulcer. Very rarely indeed is the lesion confined to the stomach, though Litten has reported one case in which no spot of ulceration was found elsewhere in the digestive tract, and Eppinger also has made a similar observation.

Lava and Orlandi further speak of the failure to find tubercular lesions in the lungs and other organs in one case, and Leven found in some of his cases only cheesy mesenteric glands as a possible focus of the disease. In spite of these and other observations, it is believed that gastric tuberculosis is rarely primary.

Although the most frequent means of infection in gastric tuberculosis was thought by the older writers to be through tubercle bacilli taken with the food, or through tuberculous sputum which had been swallowed, it would seem in the light of more recent investigation, that it is conveyed very often through the agency of the blood stream (Arloing), and through the extension of infection from some neighboring tissue or organ (Chiari, Reinhold, Beneke).

The normal gastric juice, moreover, while it has no specific bactericidal qualities, furnishes a certain amount of protection against tubercle bacilli in infected foods, and the epithelium of the gastric mucosa is well protected by the mucous secretion, which tends also to diminish the virulence of the germ.

It is thought that the perigastric glands are often the primary seat of gastric tuberculosis, and that in the walls of the stomach the lymphatics of the mucosa are probably the first affected.

Under normal conditions of the stomach

*Read before the International Congress on Tuberculosis, Section in Surgery and Orthopedics, Washington, D. C., October 2, 1908.

there is a great resistance to tubercular infection. In inflammatory conditions, however, as a result probably of alterations in the normal acidity of the gastric juice, the mucous membrane may become more vulnerable, and some of the innumerable slight abrasions of "micro traumas," which are received in the region of the pylorus, may, under certain conditions, furnish an *infections atrium*. It is possible also for retrograde infection from the duodenal mucosa to occur. (Durante, Patella.)

Years before the discovery of the tubercle bacillus in gastric ulcer, gastric tuberculosis had been recognized and described under various names, as a considerable literature attests. That it is a rare condition all the autopsy records show. Thus Eisenhardt, out of 1,000 autopsies in tubercular subjects, examined between 1886 and 1900, in the Munchener Path. Inst., found only one case of true tubercular ulcer of the stomach.

Kuhl and Glaubitt, in the Kiel Institute, between 1873 and 1880, found 14 cases. Miliary tuberculosis, much the commoner form of gastric tuberculosis, does not for the present concern the surgeon. His interest is limited to the ulcers of the gastric mucosa, and especially to the pyloric stenoses due to tuberculosis.

Tubercular ulcers of the gastric mucosa are very rare. Simmonds saw but eight cases of secondary chronic tubercular gastric ulcer in the course of 2,000 autopsies in Hamburg, during a period of ten years, whereas, during the same period he found the type of disease which forms a part of a general miliary tuberculosis to be relatively frequent.

Ricard and Chevrier, in fifteen years' autopsy experience in the Paris hospitals, observed only four cases of tubercular pyloric stenosis. The tubercular gastric ulcer has certain features which serve to distinguish it from the simple round ulcer, which is not uncommonly found in the tuberculous. It is most often solitary, but occasionally multiple. In size it is generally small and in shape round, though it may reach a large size as in the classical case of Simmonds, where it measured 20x10 cm.

The site of predilection for the ulcer is the pars pylori. Thus out of 21 cases collected by Letorey, the pylorus was affected eight times, the greater curvature four times, the anterior and posterior wall three times, and the lesser curvature and cardia twice. Struppler found one ulcer which extended nearly around the whole pylorus, and which led to perforation and a fatal peritonitis.

The base of a tubercular gastric ulcer may be at varying depths. It may impinge upon the muscularis mucosæ, the submucosa, or the muscular coat. Its surface is yellowish in color, or a pale grayish red granulating area, studded over with tubercular nodules. The microscope shows generally an infiltration of the submucous coat more or less extensive, and at the borders of the ulcer, great infiltration of round cells mixed with giant cells and tubercular necrotic foci are evident. The blood vessels are often the seat of an endarteritis or endophlebitis, as in syphilis and tubercle bacilli are to be found upon the surface or within the depths of the ulcer.

Sometimes the vessels become eroded, as in simple gastric ulcer, and a fatal hemorrhage ensues. Four cases reported by Arloing met with such a fate. Sometimes the ulcer may extend to the overlying peritoneum and lead to a perforation and general peritonitis, or adhesions may form between the stomach and neighboring discera and lead to fistulous communication with other parts of the alimentary tract. Thus Letorey reports one case in which the base of a tubercular gastric ulcer was formed by the adherent liver, and Mathieu and Remond observed a fistulous communication between the diseased pylorus and the duodenum.

Hilgenreiner, out of the older literature, found two cases of fistula between the stomach and the transverse colon, viz.: Abercrombie's, 1843, and Oppolzer's, 1867.

A combination of tuberculosis and carci-

noma of the stomach occasionally occurs, and the theory of such a coincidence is, that the carcinoma may be engrafted upon the tuberculosis, as a result of the decreased resistance furnished by the diminution of the normal gastric acidity. It must be remembered that the simple round ulcer of the stomach not infrequently occurs in the course of pulmonary phthisis, and one writer goes so far as to state his belief that most cases giving definite symptoms of gastric ulcer under these conditions are not tubercular ulcers.

A case in point recently came under my own charge, in 1906, and was operated upon by me.

*Case.*—J. C., Italian, æt. 41, admitted to Roosevelt Hospital, June, 1906, suffering from pulmonary tuberculosis, and for the last six months from symptoms of gastric ulcer. Nausea, epigastric pain after eating, marked hyperacidity of the stomach contents, with some epigastric tenderness, were the principal features.

The case had been referred for surgical treatment for the reason that the stomach conditions rendered ineffectual all efforts toward proper feeding for the betterment of his lung tuberculosis.

Operation June 18, 1906, revealed a chronic ulcer with indurated edges, represented by a hardened round adherent area upon the posterior surface of the stomach, about midway between the borders and about 3 inches from the pylorus. There was no pyloric stenosis, so the ulcer was excised and the wound closed. Prompt recovery ensued and the general treatment of his lung condition was resumed successfully. The patient at present is in good health.

Besides the lesions of the stomach which are obviously tuberculous, Poncet and Leriche have recently described a third form of tubercular disease, to-wit, a hypertrophic form, analgous to the hypertrophic intestinal tuberculosis, and which has its localization especially in the pylorus. In this form it is impossible to state, they say, exactly to what extent the tubercular element is casual.

*Diagnosis.*—The diagnosis of tubercular gastric ulcer with or without pyloric stenosis is always very difficult, and often quite impossible. Those cases in which the ulcer does not involve the pylorus have no absolutely distinctive features, and are practically, as far as present knowledge is concerned, entirely without the domain of surgery. All cases observed in the course of operation or autopsy should be carefully studied, therefore, with reference to any points in their symptomatology which may perhaps form a basis for rational diagnosis and treatment.

Pain in the region of the stomach, anorexia, vomiting, occasionally of blood, together with the cough, the diarrhœa, and the cachexia of the accompanying pulmonary lesion, make up the clinical picture.

These features, however, are not sufficiently distinctive to frame even a probable diagnosis, nor does the gastric analysis help one to more definite conclusions in these cases. To be sure, hyperchlorhydria is the rule in simple ulcer, and the reverse in the tubercular type, still in some cases the rule does not hold, and the tubercular ulcer of the stomach, in numerous reported cases, has been characterized by hypersecretion and hyperacidity, so that we are not, with the data at our disposal, at present able to base our conclusions upon the gastric analysis.

One important feature in tubercular gastric cases is diarrhœa, and this, even in cases where there is no intestinal involvement. But diarrhœa is such a common complaint in cases of pulmonary tuberculosis, that it will probably not attract attention in most cases sufficiently to aid in making the diagnosis. The reliability of tuberculin in fixing the diagnosis is unfortunately doubtful, and its use is not free from danger. It seems highly probable, therefore, unless the ulcer be situated at or near the pylorus, and gives rise to very definite symptoms of stenosis, the diagnosis will not be made.

When stenosis of the pylorus occurs in a case of tuberculosis of the stomach, the symptoms are the same as in stenosis from other causes, except that perhaps diarrhœa is more apt to be present in the tubercular cases, whereas, constipation is the general rule. Wide dilatation may occur when the stomach is free from adhesions, and while the characteristic gastric peristaltic wave is not demonstrable in all cases, this is probably a matter of adhesions rather than a special feature of the tubercular cases. There are two varieties of tubercular pyloric stenosis—one with a rapid course, and the other with a rather slow course. The former variety is the more common.

Stenosis generally develops much more rapidly in the tubercular cases than in the cases of carcinoma of the pylorus, and intercurrent disease is a much more frequent accompaniment.

Alessandri gives a resume of the literature of cases of tubercular pyloric stenosis, in which the diagnosis was made in the course of an exploratory laparotomy, and concludes that the number of cases would be somewhat greater if all cases of stenosing and non-stenosing new formations at the pylorus were submitted to careful microscopical examination. His own case was a girl, aged twenty-one, who had been sick for seven months with symptoms of pyloric stenosis, with great enlargement of the stomach, and a palpable mass, the size of a hen's egg, under the lower right ribs, and which was movable. The pylorus was resected. There were no adhesions and the operation was easy. Examination of the excised portion showed stenosis of the pylorus by a tubercular mass. A good recovery ensued.

Ricard and Chevrier report four cases of pyloric tuberculosis. In reviewing the subject these writers found that primary pyloric tuberculosis with stenosis had only been observed three times in 107 cases of tuberculosis of the stomach.

Nordemann reviews 126 cases of operated gastric tumors, among which only one was a case of tuberculosis. In this case a hypertrophic tuberculosis of the submucosa, blocking the pylorus, was present. It occurred in a woman thirty-seven years old, in whom a clinical diagnosis of carcinoma had been made, and a pylorectomy performed. There were no clinical evidences of tuberculosis either at the time of operation or two years later after healing. In this case hydrochloric acid (HCL) was absent and lactic acid present in the analysis of stomach contents before operation. Nordemann regards this as a case of probable infection per orem.

Jacobs reported a case in a girl of seventeen, upon whom he performed a laparotomy for tubercular peritonitis with good results, but in whom one year later symptoms of pyloric stenosis developed, for which he performed gastro-enterostomy. At the operation he found the pylorus obstructed by a ring-like mass of indurated tissue, which he traced back to a proliferation from the original trouble. The case recovered.

Of thirteen cases of tubercular pyloric stenosis reported by another writer, seven were between twenty and thirty years of age, and six were scattered about equally between the other periods of life. This corresponds generally to the observations of others, that tubercular disease of the stomach, whether primary or secondary, belongs to the earlier periods of life.

Certain cases of stenosis at the pylorus have been observed which were due to pressure of masses of tuberculous glands in the neighborhood, or to adhesions of peripyloric formation. Such cases have been reported by Ricard and Chevassu, Godart and Leven.

*Prognosis.*—The prognosis in these cases depends upon the condition of the other organs of the body. Rarely will the surgeon meet with an ideal case for resection, yet such cases have been reported.

The surgical treatment in cases of stomach tuberculosis may be palliative or radical.

Under palliative measures gastro-enterostomy is the operation of choice, since pyroplasty and gastrolysis have generally been found inapplicable or entirely wanting in efficiency. As a means of radical extirpation of the local disease, resection may be considered, i. e., pylorectomy or partial gastrectomy.

To the ten cases of operation for tubercular pyloric stenosis collected by Ricard and Chevrier in 1905, Brenner adds eleven, bringing the number up to twenty-one, as follows: Fourteen gastro-enterostomies; four resections; five pyloroplastic; one gastrolysis.

Of the four cases of resection the diagnosis was absolute in three; in the fourth, Alexander's case, it is most probable. All were resected under the impression the case was one of carcinoma.

Billroth's method, No. 2, was used twice, and Kocher's once; in the fourth case the method is not stated. Two cases recovered, two died as a result of the operation. In one case of recovery (Koerte's) the patient, eighteen months after operation, was still alive, but had "apical catarrh."

Of the fourteen gastroenterostomies, a histological diagnosis was made in seven, and in the others the gross appearances were sufficiently conclusive. Twice was the stenosis extra-parietal, being caused by compression of tuberculous glands. Clinical evidences of high grade stenosis were present.

In one case, the gastro-enterostomy was secondary to a pyloroplasty, which was ineffective. Seven cases were operated on by the retrocolic anastomosis and two cases by the anterior method. In five cases the method is not described.

One of the anterior gastro-enterostomies developed symptoms of "vicious circle," and called for a later entero anastomosis. And in one case, besides the gastroenterostomy, an entero plastic operation was done for an accompanying intestinal stenosis.

One case was well after three years; one case died three and one-half years after operation of multiple tuberculosis. One case died after a year of tubercular peritonitis; one after eight months from the same cause; one after ten months from multiple tuberculosis; two cases died of lung tuberculosis after one month. In two cases operative recovery is reported. In one case no details are given. In one case after two months a second operation was necessary.

In most cases which recovered from the operation, the result was the same as in inoperable carcinoma, i. e., palliative, in that the starvation was relieved and the patient made more comfortable.

Both cases of pyloroplasty fared badly, the one, Ruge's case, developed symptoms which necessitated a later gastro-enterostomy. In the second case, Mayo Robson's, which did well for a week, suddenly got worse and died in two weeks. The operator remarks that "with my present experience I should have performed gastro-enterostomy, and begun feeding at once, and I believe the result would have been different."

The case of gastrolysis of Ricard and Chevrier was not improved, and died a few months later of perforation and hemorrhage.

In summing up these results Brenner remarks: "The outlook of operative treatment in these cases is bad. The patients are tubercular, remain tubercular, and for the most part, in a short time die tubercular. Of the twenty-one cases (one operated twice) only two are known to be alive after three years, and two which lived two years. Of the others, most of them died in the course of a year, and a good part of them shortly after operation. Perhaps," he concludes, "the statistics of fifty years, with larger number reported, will show a more pleasant history." He looks forward to a time when some internal specific may be found which will act as an adjuvant to the necessary surgical measures.

Summing up the operative results in all his

collected cases, Brenner agrees with Ricard and Chevrier, that pylorectomy is dangerous and often not radical, except in the very rare case of movable pylorus, with no adhesions or other involvement of the glands or other organs. That gastrolysis and pyloroplasty are absolutely ineffectual, and that gastro-enterostomy under the usual conditions found gives the best results, and is the logical, correct and most effective measure at the command of the surgeon.

THE LIVER.

Tuberculosis of the liver is probably always secondary either to an intestinal or a general miliary tuberculosis. The relatively great frequency of intestinal as compared with stomach tuberculosis, makes tuberculosis of the liver also of rather more frequent occurrence; and similarly the age at which it most frequently occurs, is in childhood. Infection is generally conveyed through the blood stream, though the bile ducts cannot be entirely eliminated as possible channels, in view of the experimental work of Sergent, 1895. Involvement through the lymphatic current probably does not occur. The tubercle bacilli may be conveyed to the liver through the portal vein or the hepatic artery. When through the latter channel, the liver tuberculosis forms merely part of a systemic infection.

Another source, however, must be included as a possibility, i. e., the toxic influence directly or indirectly exercised by the tubercle bacilli. Certain cirrhotic changes are believed to be due to this cause, and even when tubercle bacilli are not found, these cases are still to be considered as of tubercular origin.

Although tuberculosis of the liver is generally not recognized during life, there are numerous striking instances where it has led to definite symptoms. It may occur in the form of miliary tubercles upon the surface, or scattered through the organ, which may be considerably enlarged. These cases are observed in the course of a general miliary tuberculosis, form a part of a general systemic infection, and are outside the field of surgery.

The second form of liver tuberculosis is represented by the occurrence of caseating masses of various size and variable location. This represents a more chronic process and includes occasional cases which are amenable to surgery.

Rome reports having successfully excised such a mass.

The third form of liver tuberculosis, and the one which especially interests the surgeon, is the tubercular abscess. This may be regarded as a later phase of the caseating variety.

The first stage in the formation of these tubercular liver abscesses appears to be the formation of tubercular foci in the portal spaces. These, as they increase, often by conglomeration, form variable sized and shaped masses, which, breaking down, may occasionally perforate into the bile ducts, causing a cholangitis.

These abscesses may remain well within the substance of the liver, or they may approach the surface of the liver, giving rise to a palpable tender tumor. Or they may form adhesions between the liver and the diaphragm, leading to the formation of a tubercular subphrenic abscess or a perihepatic abscess in other situations.

Perihepatic abscesses are believed to be much more common than the intrahepatic variety, and although these tubercular affections of the liver, in occasional cases, may be the only local manifestations of the disease, as a rule they constitute but a small part of the pathological condition.

Intrahepatic abscesses are, as a rule, of small size, but may exceptionally attain considerable dimensions, as in the case cited by Waring. In most cases of such tubercular liver abscess, no special symptoms are present which depend upon its existence, and it is frequently only discovered at autopsy.

The perihepatic variety, however, which is

the more common, generally begins as a localized tubercular process in some superficial portion of the liver, and extends toward the surface, where it causes a perihepatitis and the formation of inflammatory adhesions between the covering of the liver and that of some adjacent organ. These adhesions help to localize the abscess to the region of the diseased portion of the liver, and to prevent the occurrence of a general peritoneal tuberculosis.

Any part of the liver may, of course, be affected, but the convexity of the right lobe is the part which has been most commonly involved. In the rare cases where the inferior aspect of the liver is the seat of the disease, it may happen that a localized chronic abscess is found, which may exist for a long time without giving symptoms which render the diagnosis possible, and sooner or later such an abscess spreads toward the antero-inferior border of the gland and the adjacent portion of the abdominal walls and causes a swelling which is palpable and which exhibits the characteristics of a localized abscess. In some cases, however, the inflammatory process spreads to the peritoneum and sets up a tubercular peritonitis, which may become more or less general, and which is accompanied by sypmtoms which are characteristic of this disease.

Diagnosis, in cases of tuberculosis of the liver in which an intrahepatic abscess is present, is practically impossible, since, as a rule, there is no considerable enlargement of the organ, and there is no special train of symptoms. The subphrenic variety, however, gives rise to certain physical signs similar to those in ordinary subphrenic abscesses, such as are due to the extension of a tubercular process from the lung or pleura.

When the lower surface of the liver is involved, the diagnosis is generally not possible, until the inflammatory process has extended to the adjacent portion of the anterior abdominal wall, and a localized abscess has been formed.

The tubercular nature of an abscess in connection with the liver may sometimes be made out by an examination of the fluid withdrawn at an exploratory puncture. Tubercle bacilli may be found in the material so withdrawn, but this, too, is by no means the rule, since in a very old tubercular lesion it is not possible always to find the bacilli at the first examination.

The contents of these abscesses are generally very thick, and it may be necessary to wash out the needle before the matter can be drawn and examined.

Treatment in these cases is surgical, as in other cases of hepatic abscess.

In order to promote the easy evacuation of contents in the central abscesses, it is recommended to scrape the walls of the abscess with a Volkmann's spoon and pack the cavity with iodoform gauze.

As the liver abscess is generally but one part of the pathological picture, appropriate treatment of the other organs should be carried out also. When the abscess is on the inferior surface of the liver, and appears as a swelling of the anterior abdominal wall beneath the situation of the lower edge of the ribs, an incision over the most prominent part of the swelling is made, and the cavity of the abscess irrigated and drained.

Incision into the subphrenic abscess, which does not present anteriorly, may be made through the thoracic wall by resection of ribs, or in the lumbar region following the lower border of the last rib. The location and connection of the abscess, of course, determine the method of approach.

*Prognosis.*—In most cases of tubercular abscess of the liver the prognosis is not good on account of the associated lesions in other organs, especially the lungs. When, however, it is localized to the liver, and it is early diagnosticated and promptly evacuated, it is pos-

sible that the patient will remain well if other conditions can be dealt with by general measures.

### TUBERCULOSIS OF THE GALL-BLADDER.

Most of the standard works make no mention of tuberculosis in the gall-bladder. It is an exceedingly rare affection. Maylard, in his latest work on abdominal tuberculosis, makes brief reference to it, and quotes a case of Lancereaux, quoted by Rolleston, in which the common bile duct, cystic duct, and the gall-bladder were involved in a tubercular inflammation, in a woman of thirty-two. In this case, it was supposed that the infection had been derived by direct extension from the duodenum.

Holmes quotes Sergent as having encountered cases of gall-bladder tuberculosis, but in nearly all there was general systemic tuberculosis present. These are the only referencs I have been able to find, with the exception of the case of Kirsch.

Kirsch (Uber Euien Fall von Cholecystitis Tuberculosa Chronica, Prog. Med., Woch., No. 6, 1902) reports a case in a woman of fifty-seven, in which the wall of the gall-bladder was completely destroyed by tuberculosis. The autopsy showed the gall-bladder adherent to neighboring organs, especially the duodenum and the transverse colon. The colon communicated directly with the gall-bladder through a small opening. In the gall-bladder were numerous stones and thick, yellow pus. The walls of the organ were badly infected, and the inner lining was covered with caseous deposits. Under the peritoneum, the wall of the gall-bladder was replaced by caseous masses of a grayish substance. The process extended also to the liver, and involved the cystic duct to its distal, one-fourth. The microscope confirmed the clinical diagnosis.

From the standpoint of the surgeon, tuberculosis of the gall-bladder presents no means as it is practically always part of a systemic of identification except an accidental one, and infection surgical measures are generally unwarranted.

### TUBERCULOSIS OF THE PANCREAS.

The more careful examination of the pancreas at autopsy in recent years, in the course of investigations of its various diseases, has led to the discovery that it is rather more frequently involved in tubercular disease than a study of the earlier literature would lead one to believe. Still, tuberculosis of the pancreas is an extremely rare affection and with few exceptions is confined to cases where the involvement forms part merely of a systemic infection.

Statistics show that tuberculosis of the pancreas is most frequent in children and practically always a secondary lesion.

The pancreas may be infected by tuberculosis through the blood, or by contiguity. While infection through the duct of Wirsung is possible, it is regarded as being very improbable, for as in the case of the bile ducts, the bacilli would have to enter the organ against the natural current.

In the pancreas, as in the liver, we find miliary tubercles, or caseous masses, and these masses may break down to form abscesses.

In a case reported by Mayo Robson an abscess was found which burrowed behind the peritoneum and presented in the loin like a spinal abscess.

Oser refers to abscesses bursting into the intestine, and Kudretsky reports a similar occurrence.

The cases of so-called tubercular abscesses of the pancreas, and which alone possess any surgical interest, are found often not to be cases of real pancreatic tuberculosis, but rather cases of tubercular masses in the adjacent lymphnodes, or in those imbedded in its

substance. Most cases, indeed, of large caseating masses in the region of the pancreas, on closer examination, have been found to be examples of lymphatic gland tuberculosis and not tubercular pancreas. The remarkable case of Sendler, often refered to as an example of successful removal of a portion of a tubercular pancreas, was found on microscopic examniation, to be really an enucleation of a tubercular gland the size of a walnut, from the neighborhood of the head of the pancreas.

It may be true, after all, on closer inspection of many cases of suspected tuberculosis of the pancreas, that they were cases of lymphatic gland tuberculosis, impinging on the pancreas, rather than a true pancreatic tuberculosis. And the assertion of the older writers, that the pancreas itself is rarely the seat of tuberculosis may be a true one.

Infection from the overlying peritoneum or from the kidney may take place. Here, as in the liver, a peculiar form of cirrhosis may also occur as a result of the toxic influence of the tubercular infection, and without the local existence of the tubercle bacilli.

Diagnosis is still to be written.

Treatment, except in the case of abscess which presents externally, is nil.

The symptoms in the few recorded cases are of no diagnostic value. The presence of a tumor, together with other facts suggestive of tuberculosis, may lend some aid in the differential diagnosis. At best, however, the diagnosis will be purely speculative, and the treatment a matter of judgment in individual cases.

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PARTIAL BIBLIOGRAPHY.

Joseph Coats—Glasgow Medical Journal, 1886, Vol. XXVI., p. 53.

Litten—Virchow's Archiv. Bd. 67, 1876.

Eppinger—Uber Tuberc. des. Magens und des Oesophagus, Prag. Med. Woch., 1881, No. 51 and 52.

Lava and Orlandi—Gaz. Med. di Torino, 1893.

Leven—Gastrectasie due a une Compression du pylore, etc. Bull. de la Soc. Anat., Feb., 1901.

Eisenhardt—Diss. Muenchen, 1891.

Glaubitt—Uber Magen Tuberc. Inaug. Diss. Kiel, 1901.

Simmonds—Uber Tuberc. des Magens. Muench. Med. Woch., 1900, No. 7, 8 and 10.

Ricard and Chevrier — Tuberculeuse du pylore, Rev. de Chir., 1905, No. 5, 6 and 7.

Simmonds—Uber Tuberc. des Magens. Muench. Med. Woch., 1899, No. 10, March 6.

Letorey—Contribution a l' etude des ulceration tuberc. des estomac. These de Paris, 1895.

Struppler—Uber de tuberc. Magenseschwur, etc. Zeitschrift fur Tuberc. Bd. 1, 1900.

Arloing, F.—Des Ulcerations tuberc. de l'Estomac.

Mathieu—Ulc. tuberc. de l'estomac. Prog. Med., 1882.

Mathieu and Remond—These Letorey.

Reymond—Peritonite localisee, etc. Bull. de la Soc. Anat., 1894.

Hilgenreiner—Du Erworbenen fisteln des Magen Darm. Kanals Deutsch., Chir., 1905.

Poncet and Leriche—Academic de Med., 30th May, 1905.

Alesandri, R.—Tuberc. de Piloro. Resection Bull. dell R. Acad. di Roma, 1895.

Oppolzer—Med. Presse, 1867, No. 50 & 51.

Nordmann—Zur. Chir. des Magen-Geschwulste, Arch. fur Kl-chir., Bd., 73.

Jacobs—Stenose du pylore par localizations tuberc. Prog. Med. Belg., 1900. Reprint Centralblatt fur Chir., 1901, No. 26.

Chevassu—Bull. de la Soc. Anat., 1902.

Godart—La Policlinique, 1901, p. 183. Ibid, 1904, p. 481.

Grenner—Tuberc. des Magen Darmkanals. Deutsche Chirurgie, Kiel, 1904., 46 E.

Kuhl—Uber Tuberc. Magen Geschweire. Inaug. Diss. Keel, 1889.

Ruge—Uber primare Magentuberculose. Beirrag fur Klin. der Tuberc. Bd. 3, No. 3.

Mayo Robson—Clin. Soc. of London, 1895, Vol. XXXIII.

Brenner—Deutsche Chirurgie Bd., 46, C., 1907.

Tuberculose, Actinomycosis, Syphilis des Magens und Darm Tract.

Sergent—These de Paris, 1895.

Rome—Annals of Surgery, 1904, Vol. XXXIX., p. 98.

Maylard—Abdominal Tuberculosis, 1908.

Holmes—Annals of Surgery, Vol. 43, 1906, p. 800.

Patella—Delle Stenosi, piloriche nei Tuberc.

Durante—VI. Congress, April 16, 1889, also Polichinico, Vol. V., 1898. Gaz. degli Osped, May 3, 1900.

Alexander, M.—Beitrag zur Tuberc. des Magens, Deutsche, Archiv. f. Kl. Chir., 1905-06, No. 86.

Lancereaux—Traite de Malad. de la foie, 1899.

Fletcher—Trans. Path. Soc. London, 1899, Vol. 50, p. 170.

Petruschky—Zur diag. und Therap. des primaren ulc. vent. Tuberc. Deutsch Med. Woch., 1899, Vol. IX.

Reed—Tuberc. Ulcerations in Stomach. The use of Tuberculin., International Medical Mag., N. Y., 1900, Vol. IX., p. 197.

Marfan—These de Paris, 1887.

Chiari—Munch Med. Woch., 1878.

Beneke—Virchow, Jahresbericht, 1851, T. III.

Reinhold—Inaug. Diss., Kiel, 1899.

Haberer—Ueber ein Seltener Fall von Magen und Darmstenose, 1897, Review in Zentralblatt fur Chir., 1905, p. 1368.

Cassignol, B. M. P.—Essai fur la phthisie hepatique, Paris, 1808.

Elliesen, P.—Uber Multipel Solitar tuberkel in der Lever, Erlangen, 1900.

Ginger, S. G.—Experimental T. b. c. of the Liver, St. Petersburg, 1902.

No. 177, Supplementary Volume, p. 123-8.

Le Simple—Contrib. a l'etude des Absces tbc. au foie, Paris, 1900.

Reverseau, D.—Contrib. a l'etude des pyo. perihepatites tuberculeuses, Paris, 1895.

E. Sigg—Uber Conglomerat tuberculose der leber, Zurich, 1901.

Suzuk—K. Uber die leber tbc. bie tbc. Andere Organes Wurzburg, 1899.

Fletcher, H. M.—Tubercular cavities in the Liver, Trans. Path. Soc., London, 1898-99, p. 7, 160 and 175.

Frank, L.—Primary Tuberculosis of the Liver. American Journal Med. Sci., 1902, 630.

Lannelongue—Tub. hepatique et peri hepat. hepatotome Cong., 1888.

Laubry, C.—Les hepat. tbc., Int. Medicale, 1902, p. 266.

Mackenzie, H. W.—Tubercular Dis. of the Liver, Trans. Path. Soc., London, 80-90, 111-156.

Moore, F. C.—Muench. Med. Chronicle, 5-19-1899.

Baudoni—La cirrhose tuberc. ches l'enfant, 1902—Rev. Mens. de l'enfant Waring, Diseases of Liver, etc. Mayo Robson and Moynihan, Dis. of Liver, etc.

J. Loheac—Tuberc. du pancreas, Paris, 1899.

E. Pallier—t. b. du Pancreas, Paris, 1892.

Abeille—Un cas de t. b. pancreatique, Marseilles Med., 1906, p. 401.

T. Barlow—On a case of t. b. of Panc. Trans. Path. Soc., London, 75-76, p. 173.

E. T. Bruen—Specimen from a case Phila. Co. Med. Soc., 1884-5.

P. Carnot—De l'sclerose, tb. du panc. Comp. Rend. ac de le, Paris, 1897.

F. E. Italia—Panc. E. tuberculosi Policlin Rome, 1900, 1901.

E. Lefas—Etude Anat de l't. b. du Panc. Arch. Gen. de Med., Paris, 1900, Vol. 7. 1057.

A. Sholomorich—Primary t. b. of Panc. Kurzan. Med. Jour., 1904, 373.

L. V. Soboleff—Virchow's, Archiv., 1904,

# RENAL CALCULI.*

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1. *Historical.*—Although the presence of stones in the kidney has been known for centuries, and various operations performed for the drainage of abscesses caused by the presence of such calculi, the modern history of the subject dates from the time when Simon, in 1871, removed a kidney for calculi because he feared the hemorrhage incident to a nephrotomy. Henry Morris, of London, was the first surgeon to perform a nephrotomy for calculi, and Czerny the first to make an incision into the pelvis (pyelotomy) for the same purpose. With the perfection of our methods of diagnosis of the surgical diseases of the kidney, especially the use of the X-ray and ureteral catheterization, the number of cases which have been successfully operated upon for renal and ureteral calculi is rapidly increasing.

2. *Etiology.*—Although by analogy with gall stones, one would expect to find a nucleus in the majority of renal calculi, yet as a matter of fact, this is seldom the case. A blood clot, particles of inspissated pus or mucous mass of epithelium and parasites, such as the bilharzia and distoma hematobium, are only rarely found as the nucleus. That the disease is more prevalent in tropical countries, and that those persons whose nitrogenous metabolism is disturbed, are predisposed to the formation of calculi in the kidney, is a well recognized fact. Calculi are most often present in but one kidney, but there can be no question that if one is content in a case of suspected renal calculus, with simply taking a skiagraph on one side, that many bilateral stones will be overlooked. I will refer again to the necessity of taking compression pictures of both kidneys—since the presence of bilateral calculi is not nearly as infrequent as has been generally believed. In a recent case of the writer's, the skiagraph showed the presence of calculi upon both sides, although all of the symptoms were referred to the left kidney. Kummell, in a recent article (*Zeitschrift fur Urologic,* Nos. 3 and 4, 1908,) found bilateral calculi in sixteen out of 101 casies, *i. e.,* nearly 16 per cent. Israel, in his book on "Surgery of the Kidney," published in 1901, estimates that the calculi were present on both sides in 27 per cent. of his cases.

3. *Frequency and Position.*—As to the relative frequency of the various forms of calculi it is a generally accepted fact that the pure uric acid or urate calculi occur most frequently next the oxalates and phosphates. Other forms, such as the cystin and xanthin, occur quite rarely. The uric acid and oxalate stones are usually found in acid urine, but when the latter becomes alkaline, the deposition of ammonium and magnesium phosphates takes place and the calculi grow quite rapidly in size. Renal calculi vary greatly in their shape and size. Those found in the parenchyma are usually quite small and are oval or round. In the calyces they become larger and often have the shape of a calyx.

Those which are found close to the orifice of the ureter are longer, and are more often hammer-shaped, having a broader upper and a narrower distal portion. Reference will be

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made in the description of the X-ray diagnosis of the fact that one can often recognize the position of the calculus, if a single one be present, as being close to the outlet of the renal pelvis by this peculiar prolongation toward the ureter. The number vary from one to a thousand, and their size varies in accordance. In advanced cases they may be so large as to occupy the entire dilated pelvis, giving rise to a peculiar form, which has been spoken of as a coral-like, having a number of projections from a central broader portion.

4. *Pathology.*—Every calculus causes more or less damage, both in the kidney in which it is located and to the opposite one. One of the most important factors in the development of the surgery of the kidney during the past ten years has been the information which the methods of determining the functional capacity of each kidney have given us as to the extent of such damage to the parenchyma. The renal changes, due to the presence of calculi, vary greatly, according to whether the urine has remained aseptic or whether it has become infected.

Calculi may be present in a kidney for many years without giving rise to symptoms or causing any changes either in the kidney in which it is located or in the opposite one.

In other words, as long as the urine remains aseptic and the calculus is in such a position as not to obstruct the outlet of the pelvis and cause back pressure upon the parenchyma, but little damage is done.

In the aseptic calculous kidney the possible pathological changes are (a) a contracted kidney, due to the production of connective tissue between the tubules; (b) a variable degree of hydro, or more properly speaking, uronephrosis. As a rule, this second sequel is of minor degree unless the ureteral orifice is almost completely blocked.

In the infected calculous kidney the possible sequelae of such an infection are (a) apyelitis, which is in reality seldom confined to the pelvis alone, but extends upward along the tubules and involves the parenchyma. (b) A pyelonephritis, in which the parenchyma may be simply the seat of an extensive leucocytic infiltration, or the infection is more active and causes the formation of multiple miliary and larger abscesses scattered through the medulla and cortex.

The macroscopic appearance of such kidneys, with their groups of little abscesses scattered over the cortex, is quite typical. (c) A pyonephrosis. This is an advanced stage of the condition described as pyelonephritis, and is the result of the disintegration of the parenchyma, with the formation either of large cavities separated by septa and containing pus and calculi. If the ureter is blocked the entire kidney is converted into a sac containing pus and calculi. (d) An infected hydronephrosis. In this an aseptic hydro, or uronephrotic calculous kidney, becomes infected, and the dilated pelvis or calyces, instead of containing urine alone, contain both urine and pus, there being sufficient parenchyma left to continue the excretion of a fair amount of urine. (e) The various forms of paranephritic complications of an infected calculous kidney. Here we may have either a paranephritic abscess or the production of granulation, and later of scar tissue around the kidney. Finally, we may have (f) a part or the entire kidney parenchyma replaced by fat, whose origin is probably in the capsular fat. An instance of such a sequel of infected stone kidneys has been recently reported (Annals of Surgery, November, 1908,) by the writer.

The effect of calculi in one kidney is to cause hypertrophy of the opposite one. In some cases the other kidney is either absent or has remained in its state of embryonal development called hypoplasia. If infection is present in one kidney the opposite is often secondarily infected through the bladder and along its own ureter, termed "ascending infection."

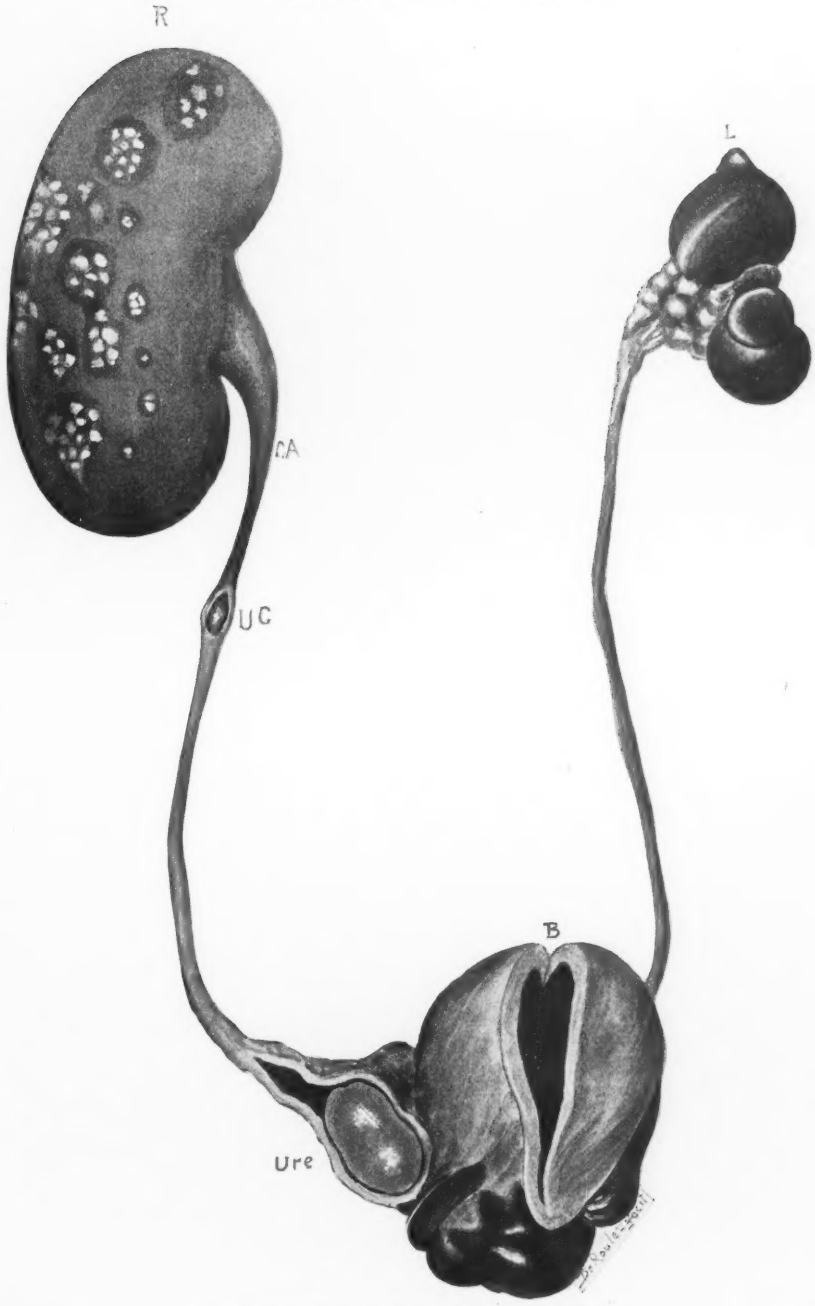


FIGURE 1.—Specimen from case of calculous anuria.

R.—Right Kidney, showing miliary abscesses of Pyelonephritis. L.—Left undeveloped Kidney. B—Bladder. C.A.—Ureter above occluding calculus. U.C.—Distended with urine. U.R.E.—Calculus at vesical end of ureter.

If calculi are present in both kidneys, the changes in each one go on independently of the other, depending upon whether one or both are infected. We thus see that many pathological changes take place in a kidney which is the seat of calculi. The extent of destruction of renal parenchyma can be fairly accurately measured by our modern means of determining the functional capacity of each kidney, described more fully under treatment.

5. *Symptoms.*—There are no symptoms which can be said to be pathognomonic for renal calculi. In the absence of positive proof in the X-ray plate, the diagnosis must always remain one of exclusion. Pain, hematuria and the passage of calculi in the urine would be positive signs, but they are rarely found together.

To take these symptoms up separately, we must first consider (a) pain as a symptom. In many patients the only sensation is a dull aching, seldom a distinct pain over the affected kidney. This is increased by running, jumping or any form of violent exercise or work.

In some cases there is a distinct pain felt over the kidney and radiating down along the ureter. The larger calculi which remain stationary are less apt to cause pain than the smaller ones, which are apt to become lodged in the ureter or migrate along it toward the bladder. During the passage of such a small calculus along the ureter, the peristaltic action of the ureteral musculature is so violent as to give rise to the clinical picture of renal colic. At this point I wish to call attention to a curious similarity between the history of the subject of gall stones and that of kidney calculi. For many years the general impression existed that one of the necessary factors in making a diagnosis of gall stones was to obtain a history of colicky attacks. The profession is just beginning to become aware of the fact that although renal colic is present in a fair proportion of cases of renal calculi, a history of renal colics is not by any means essential in making a diagnosis of nephrolithiasis and furthermore, that a number of other renal and ureteral conditions can produce such a colic. The symptom complex known commonly as renal colic is characterized clinically by the more or less sudden onset of severe pain, either first felt over the lumbar region or radiating along the ureter toward the bladder, testis, penis, inner side of the thigh, stomach, or abdominal wall. At times, the pain is referred to the opposite side, but fortunately for the diagnostician such reflex reference of pain is not frequent, but must, nevertheless, be constanly borne in mind. The pain just described is accompanied by evidences of shock or collapse, such as a rapid pulse, cold clammy sweat, restlessness, expression of anxiety and pallor. There is usually also some nausea and vomiting present. The pain may be quite localized in the ureter and not radiate. When such a condition is present upon the right side, the simulation of appendicitis is very puzzling to the less experienced observer.

The other conditions which can cause renal colic are acute congestion of one kidney, obstruction of the ureter by a valve, stricture, blood clots, inspissated pus and mucus, and finally, kinking of the ureter in floating kidney (Dietl's crises.)

(b) *Hematuria.*—Blood in the urine is a most important symptom. The blood may only be found during the attack of renal colic or it may be present in small quantity constantly. In this connection it must not be forgotten that blood corpuscles may be found in the urine during an attack of appendicitis. The mere presence of blood in the urine does not signify renal or ureteral calculi, since it may occur in tumors, in tuberculosis of the kidney or bladder and in the so-called essential hematuria of the kidney, as well as in certain forms of nephritis, especially those of an interstitial type. The older tests which attempted to differentiate between vesical and renal sources of the blood by the condition of the red cor-

puscles and by the fact that the blood appeared at a certain period of the act of urination can no longer be relied on.

The use of the cystoscope is the most reliable mode of diagnosis and will soon tell us, in the majority of cases, whether the blood is of vesical or renal origin.

The presence of blood in the urine, combined with the history of renal colics or of long continued pain in the lumbar region, will, in the absence of a positive X-ray picture, only be suggestive of renal calculus, if other renal lesions, such as tuberculosis, tumors pyonephrosis and hydronephrosis be excluded.

(c) *X-Ray.*—The use of the X-ray has been of the greatest aid in the diagnosis of renal and ureteral calculi. The majority of surgeons who have systematically employed it in their cases of suspected renal calculi are agreed that, with the proper technique, shadows of calculi can be secured in nearly every case in which the symptoms point to their presence. Such an able and reliable surgeon as Kummell, of Hamburg, believes that if calculi are present the diagnosis can invariably be made from the X-ray.

*Technique.*—Just a few words in regard to the proper method of taking X-rays of renal calculi: In the first place, proper preparation is absolutely essential, especially in stout individuals. A brisk catharsis, followed by liquid diet during the twenty-fours preceding the exposure, will clear the bowels of any substances which are apt to give shadows. Secondly, the lumbar region should be brought as close to the plate as possible by raising the shoulders and thighs so as to overcome the normal lordosis of the spine as much as possible. Third, a soft tube is a requisite aid. Fourth, if one wishes to be exact, a first diffuse

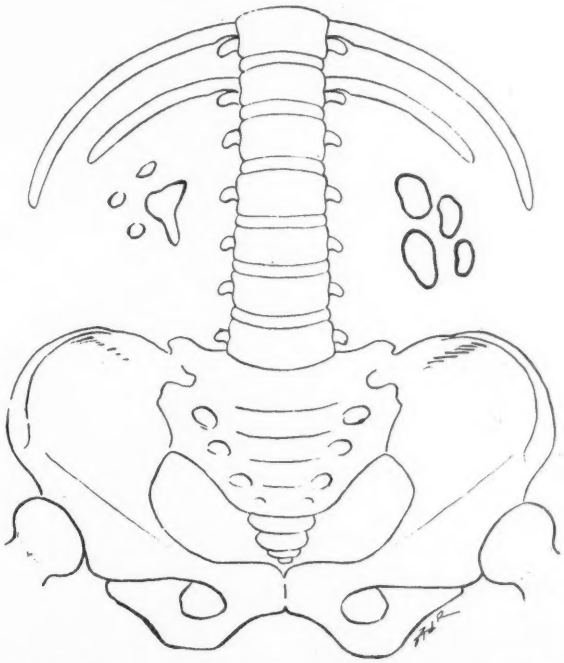

FIG. 2.—Tracings of skiagraph of a case with bilateral renal calculi.

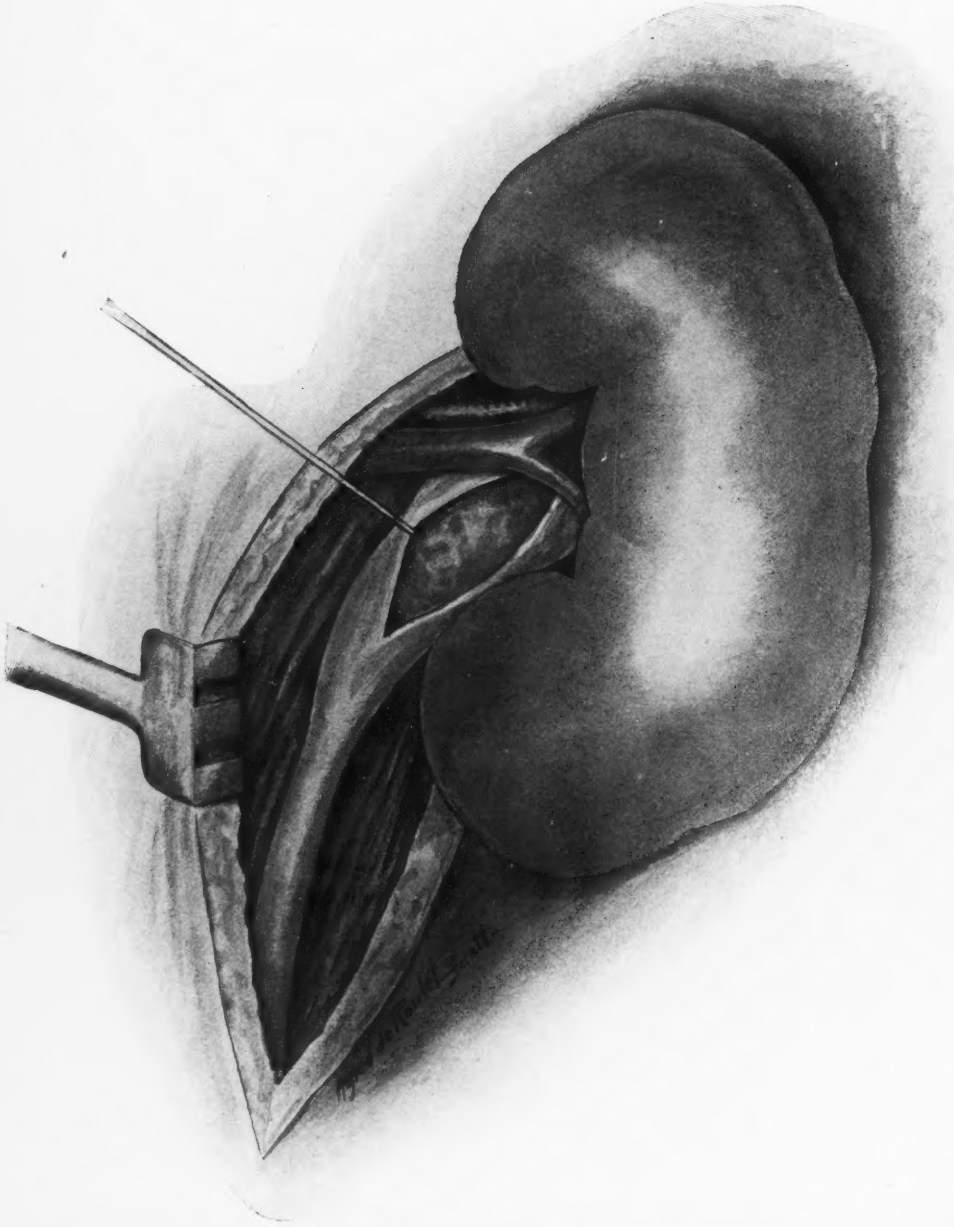

FIG. 3.—Pyelotomy for removal of calculi. Close to outlet of pelvis.

exposure of both kidneys and ureters should be made without the use of any special apparatus.

The recent rapid progress in the skiagraphy of renal and ureteral calculi has been due to the use of the Albers-Shoenberg compression apparatus, which cuts off all Roentgen rays except over a small area, and makes a much sharper picture. One should never omit taking such a compression X-ray of each kidney separately, and if possible, of each ureter. The number of cases to the present date of bilateral calculi is sufficiently numerous as to require X-rays of both kidneys in every case. In order to consider a renal skiagraph of value the last two ribs, transverse processes of the last dorsal and lumbar vertebrae and psoas muscle must be quite sharply outlined.

In the case of renal calculi one must exclude shadows due to the following conditions: (a) Tumors or dilated calyes. These show as poorly demarcated shadows. (b) Scybala. These are round, delicate, poorly outlined and darker in the center. If there is any doubt it is best to give a purgative and take another picture. (c) Foreign bodies in the intestine. (d) Calcified retroperitoneal lymph nodes. (e) Centers of ossification in the lower costal cartilages.

See article of Holzknecht and Kienbock. Zeitschrift fur Urologie. No. 5, Volume II.

Pure uric acid calculi cast the faintest and oxalates and phosphatic stones the most marked shadows. One can tell fairly accurately from the position and size of the shadow whether the calculus is large or small, whether it is in the pelvis or in a dilated calyx, and at times one can tell whether the calculus lies free in a large cavity by the change in its position during different exposures. As the present paper does not include ureteral calculi I will omit any reference to their diagnosis and recognition in X-ray pictures.

6. *The Differential Diagnosis of Renal Calculi* must include such conditions as appendicitis, kinking of the ureter, with or without intermittent hydronephrosis, non-calculous pyelitis and pyelonephritis, tuberculosis and tumors of the kidney.

7. *Calculous Anuria.*—One can not leave the subject of the diagnosis of nephrolithiasis without referring to this most important complication. True anuria arises when the arterial blood no longer reaches the kidney or the escape of the urine secreted is prevented by some obstacle in the ureter. The most frequent cause of anuria is the occlusion of one or both ureters by calculi. It can be easily understood how such an anuria can occur if the ureters of both perfectly functionating kidneys are occluded or if the ureter of the only functionating of two kidneys is occluded. It may also occur where only one kidney is left after a nephrectomy has been performed or where it is congenitally absent, or where the opposite kidney has remained in its state of embryonic development (hypoplasia.) The anuria may last from a few hours to eighteen days. One can usually make a diagnosis from the history, aided by an X-ray examination of both kidneys.

The treatment of these cases of calculous anuria will be referred to later.

8. Value of determination of functional capacity of each kidney, and ureteral catheterization. Before any operative treatment of nephrolithiasis is considered it is the duty of every surgeon, at the present time, to ascertain, if possible (a) the existence of two kidneys. (b) If the presence of the opposite kidney is positive, then one must ascertain the functional capacity of this kidney.

This knowledge is acquired by catheterizing the ureters and then employing the various functional tests. In the majority of cases it is possible to insert special catheters into each ureter and obtain the urine from each kidney separately. The use of segregators for this purpose is unreliable, since it is impossible to be certain that one is not obtaining a mixed

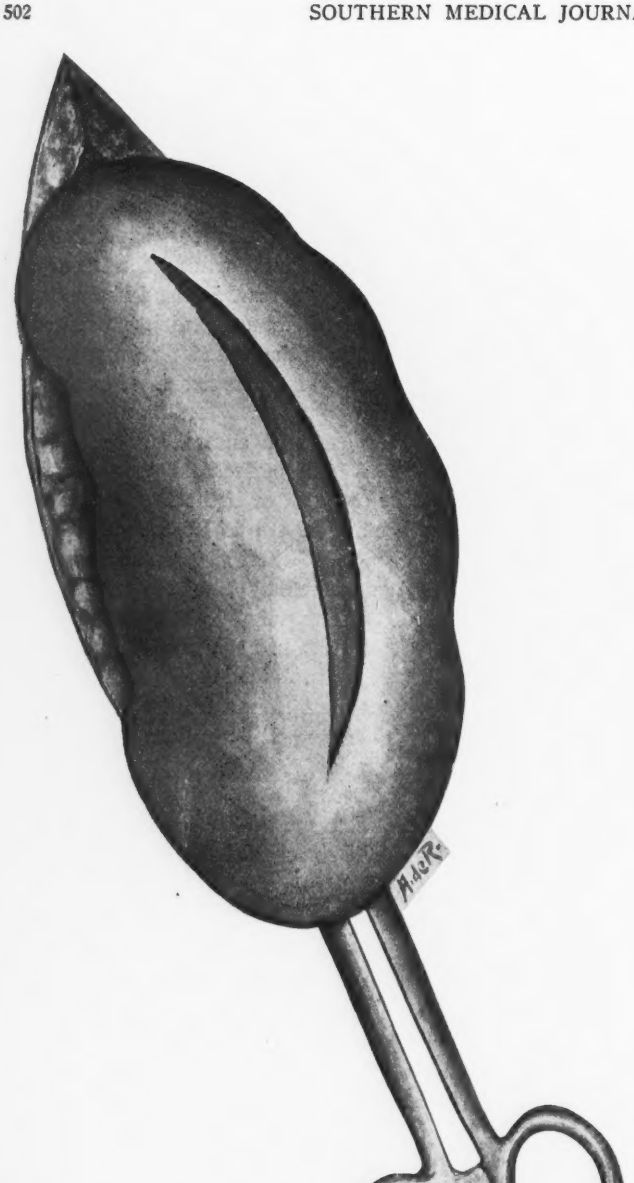

FIG. 4.—Nephrotomy with clamp in situ and Kidney brought to surface of patient's back.

FIG. 5.—C. G. Cumston's Nephrotomy clamp.

urine, i. e., from both kidneys. The danger of infecting a healthy kidney through catheterization of its ureter has been greatly exaggerated, and is in reality so remote a possibility that it should no longer be considered a contraindication to the use of the ureteral catheter. It will be impossible to dwell at length upon the value of the various methods of estimating the functionating power, but I shall simply mention my own method of procedure. Before performing an operation upon the kidney the patient's urine is collected for twenty-four hours and examined in the usual manner. Then local (cocain) anesthesia about one ounce of urine is collected from each kidney through the ureteral catheters (per Brenner cystoscope.) This urine is carefully examined for its percentage of urea, casts, albumin, etc. Then some phloridzin is injected and the time noted when the urine first begins to contain sugar. In a normally functionating kidney this occurs fifteen to twenty minutes after the phloridzin injection, and from the delay in the appearance of the sugar reaction one can draw quite reliable conclusions as to the power of excretion of each kidney. The color test, made by the injection of indigo-carmin, as first suggested by Voelcker and Joseph is also quite reliable, and can be employed at the same examination in which the phloridzin test is being used. The final test is to determine the freezing point of the blood (cryoscopy) by the Boeckmann apparatus. If the blood freezes at a point below 0.58 centrigrade it shows that the kidneys do not functionate perfectly and many metabolic products are not being excreted.

All of these tests are of great value, but they are not infallible. However, they have been found to be quite reliable in sufficiently large number of cases to warrant their use as our routine method of examination. It must be said at this point that ureteral catheterization is not possible in some cases, and if there is any doubt in these, before removing a kidney, the presence of the opposite one must be determined by exposing it through a lumbar incision.

9. *Treatment. Medical.*—That certain cases of nephrolithiasis will be greatly improved by internal medication can not be denied. When a diagnosis of the presence of a calculus or of calculi in the kidney has been made, it does not follow that an operation is necessarily indicated. As in the case of gallstones, smaller calculi will often be passed spontaneously, and the subsidence of active symptoms, such as pain, renal colic, etc., will lead one to believe that the case is cured. But this sense of security is only too often disturbed when the patient is seen again suffering from a calculous anuria or from one of the sequelae (mentioned under pathology) of an infected stone kidney. In other words, unless we have an absence of the X-ray shadow and an aseptic clear urine after the history of one or more attacks of renal colic, etc., it is illogical to conclude that the case is cured. That a stone of any size can be dissolved by any so-called solvents given internally is an utter impossibility. In the cases with pure uric acid or urate calculi, the administrations of large doses of alkaline diuretics, combined with the regular drinking of large quantities of such mild alkaline waters as Celestin, Vichy, Wildunger, or one of our American lithia waters, and a non-nitrogenous diet will unquestionably cause many of the smaller calculi or the so-called uric acid gravel or sand to be dissolved or expelled. In other words, as long as the urine remains aseptic, and there are no evidencs of any deleterious influence of the presence of the calculi upon the kidney or kidneys involved, there is no indication for operative interference.

If, however, the X-ray shows the presence of calculi, which we know from the size of the shadow can not be passed spontaneously, and especially if the urine shows the presence of pus, that patient's life is menaced by those

stones, and if the tests of functional capacity show that an operation is permissible, it should be performed before serious pathological renal changes occur. We owe it to such patients to explain the dangers of the calculi and place the responsibility of delay upon their own shoulders in case of refusal to permit an operation.

*Operative Treatment.*—There are two principal methods of removal of renal calculi. In one, pyelotomy, an incision is made into the renal pelvis (Figure 4)) and the calculus removed and the wound sutured without drainage, unless there is an accompanying infection. In the second operative method, an incision about two inches long is made a little back of the convexity (Figure 5) of the kidney through the parenchyma into the pelvis and the calculus or calculi removed in this manner. This second method, called nephrotomy, has the advantage over pyelotomy, that it permits of more thorough and direct palpation with the finger (introduced through the kidney wound) of the entire pelvis and all pockets in the parenchyma. It has, however, the great drawback of being accompanied by

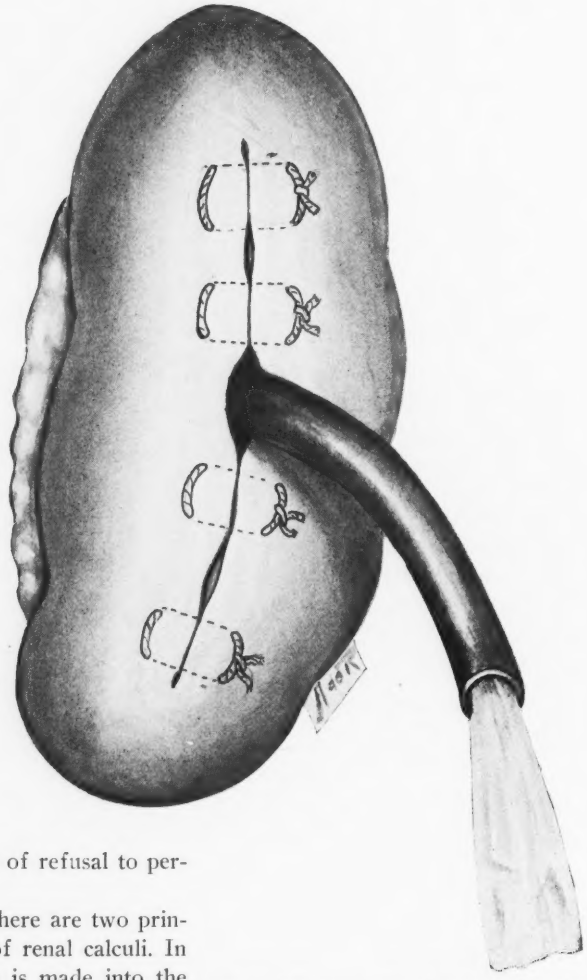

FIG. 6.—Nephrotomy wound sutured with tube for drainage.

hemorrhage, which at times is so severe as to almost exsanguinate the patient. This bleeding can, however, be overcome by compressing the vessels temporarily after the kidney has been brought out upon the back, with the fingers, or with a rubber ligature, or, better still, with some form of clamp such as that shown in figure 6. As soon as the calculi have been removed the kidney wound is quickly closed with sutures of heavy catgut and a rubber drainage tube, carried into the pelvis, inserted. The clamp is then removed and very little bleeding has occurred. The dangers of post-operative hemorrhage are, however, not to be overlooked and may be so severe as to require secondary nephrectomy.

If the X-ray shows only one calculus and that is located at the outlet of the pelvis or close to it in a non-dilated pelvis, pyelotomy is the operation of choice. The danger of fistulæ following it can be excluded by accurate suturing. There are surgeons of great experience in renal surgery, like Kummell, who advocate nephrotomy as a routine procedure, while others, like Zuckerkandl, believe that the majority of calculi can be removed through the less dangerous operation of pyelotomy. The question of which method to employ must, in my opinion, depend upon the individual case. If there are many calculi, especially larger ones, and examination of the kidney shows that it requires drainage, it is best to perform nephrotomy. If the calculus is small and in the pelvis, pyelotomy suffices. In either operation the kidney should, if possible, be delivered upon the back (Figure 5) and after removal of the stone one should pass a uterine sound along the ureter to determine its permeability.

Nephrectomy is indicated, provided, of course, that the opposite kidney is functionally normal first, if the kidney is the seat of a hydro or pyonephrosis, which have destroyed practically every trace of the parenchyma. Second, if the calculi are so large and branched that their removal is impossible without serious laceration of the organ, and third, when the formation of renal calculi accompanies a tuberculosis or neoplasm of the kidney.

Every effort should, however, be made in the case of a hydro or pyonephrosis to save a kidney unless its retention means a secondary nephrectomy in the near future.

In a calculous anuria an X-ray will usually show whether the calculi are bilateral or if only one ureter is obstructed, upon which side this has occurred. In either case removal of the obstruction is the only hope of saving the patient's life and delay is criminal. If it is impossible to secure an X-ray the history will often indicate upon which side the obstructing calculus is located. In cases, however, where the anuria appears without warning we must judge the side as in the case shown in figure 1, from the side where there is most pain on palpation or more rigidity of the abdominal wall.

In cases with bilateral calculi operation must be performed upon one side at a time. The percentage of recoveries after removal of calculi is rapidly improving, and with early diagnosis and careful attention to every detail, such as testing the functional capacity, skillful technique, etc., the mortality will soon be no larger than is that of cholelithiasis.

LIST OF ILLUSTRATIONS.

Figure 1. Calculous Anuria and Acute Pyelonephritis on one side with Hypoplasia of opposite kidney.

Figure 2 and 3. Tracings of X-ray of case of Bilateral Renal Calculi.

Figure 4. Pyelotomy.

Figure 5. Nephrotomy with clamp in situ and kidney on back.

Figure 6. Nephrotomy clamp of C. G. Cumston.

# TUMORS OF THE BLADDER.*

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The word tumor is a very ancient name and simply means a swelling. Clinically, the word is not likely to disappear, notwithstanding it has lost its importance to the pathologist.

Our knowledge of tumors of the bladder, the result of long continued pathological and experimental research, is a modern acquisition and the perfection of our diagnostic means is even more recent.

A satisfactory classification of these growths, in every respect, is difficult. The most natural method is to divide them into two classes, benign and malignant. But even this is attended with great difficulties.

Of those of the first class, *papilloma,* is the more common, and which may be sessile or pedunculated, single or multiple. This class is generally multiple, and grows from a common pedicle as do the branches of a tree. These branches, or villi, are composed of a fine stroma of connective tissue, each branch having a loop of blood vessels extending to its extremity, and covered by several layers of epithelium.

When the bladder is distended by fluid these processes unfold and float like aquatic plants in deep water, as they are seen to do when viewed through the cystoscope.

When the connective tissues stroma is particularly well developed it is called a *fibrous* papilloma and is typical because a collection of papillary formations rests upon a more or less thick pedicle; and when the branches are composed of thread-like processes, so gracefully described by Thompson, it is known as a *fimbriated papilloma.*

Clinically, these tumors are generally benign, or, as the French aptly say, good natured. But we must bear in mind that this is not always so. They may be benign in their superficial portion while their deeper parts or base is malignant.

In the benign or good natured growths, the connective tissue stroma arises directly from the mucosa or sub-mucosa, while in villous carcinoma there is a small-celled infiltration into its base, and an irregular proliferation of epithelium penetrating its deeper parts.

Villous papillomata are met with anywhere in the bladder, even in a diverticulum, but generally they are situated about the trigonum.

Among the growths of the second class, and of greatest importance, are *Carcinoma* and *Sarcoma,* which are met with frequently. They occur in various forms and are seen as huge masses growing into the vesical cavity, or even so minute as a slight infiltration of the bladder wall.

Of the two, carcinoma is the more common. It may arise in the form of hard or medullary nodules, or it may appear as a diffuse flat infiltration, involving an extensive area of the bladder wall.

Villous carcinoma may occur primarily in the renal pelvis and secondarily in the bladder,

*Read before the Southern Medical Association, Atlanta, Ga., Nov., 1908.

as a result of villous tufts becoming detached and transported to the bladder, where they become inplanted.

We distinguish, according to their structure, the scirrhus, medullary, and alveola types, cancroid and melanoma. The epithelial layers, histologically, are usually the starting point, less frequently the glands of the mucosa.

Of these the carcinoma simplex, usually termed scirrhus, is the most frequent form met with, and in which there is an abundance of fibrous tissue elements, while the specific cell elements are less prominent. Those rich in cell elements, carcinoma medullare, represent the softer forms, and are by no means rare. The most obvious characteristic of this growth is its great tendency towards ulceration at an early date.

The alveolar, or gelatinous cancer, particularly malignant, shows a characteristic colloid degeneration of the epithelium.

The cancroid contains the typical epithelium pearls.

The pigment cancer, melanoma, is characterized by a deposit of black pigment in its cells.

Sarcoma is one of the rarest growths of the bladder. Out of eighty-two vesical tumors Albarran found two cases of sarcoma.

This growth is usually seated in the fundus and is composed of spindle or round cells. Borst divides this form of growth into simple sarcoma, and the highly developed sarcoma. In the former, he includes the round cell and spindle cell sarcoma, while in the more highly developed types he includes fibro-sarcoma, lympo-sarcoma, myosarcoma, myxosarcoma and chondro-sarcoma.

The former types are derived from an excessive growth, resulting in a secondary filling up with embryonal cell elements.

The second group show manifestations of a slight degree of degeneration, unmistakable in their relationship to the various tissue types of normal tissue growth.

Concerning the causes of tumors of the bladder little is known.

Prolonged irritations, such as chronic catarrh, vesical calculus, prolonged catheterism and various other ingenious theories have been propounded, yet we can not satisfactorily explain the unknown factor in their production. Histologic study demonstrates the method of epithelial growth, but the proliferation of the epithelial bud is an effect, not a cause. It has been observed too long, perhaps, to be altogether a coincidence, that persons working in dye establishments are more prone to vesical tumors than others.

*Symptoms.*—In the majority of cases the first, the last and the only symptom of a tumor of the bladder is hemorrhage.

It may be stated, clinically, that the more villous the tumor the more profuse the bleeding.

In tumors covered with a normal membrane, as myoma and fibroma, hemorrhage is the exception.

A profuse hemorrhage unaccompanied by any other symptom is pathognomonic of either a renal or vesical neoplasm.

Pain and dysuria are secondary. Retention may occur as the result of a large clot or tumor obstructing the vesico-urethral opening.

Cystitis, too, is generally secondary to the hemorrhage, and dysuria is concomitant to it.

The urine may be entirely normal, or it may contain red blood cells, macroscopically or microscopically.

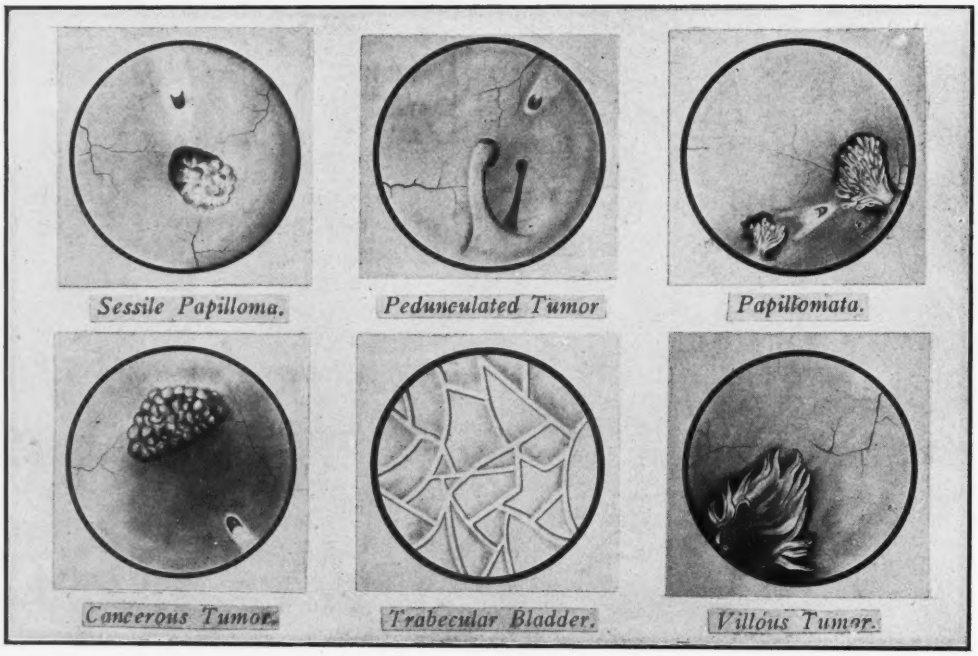
Occasionally small particles of the tumor, even as large as a pea, are voided. This happens now and then in papillomata or good-natured tumors, but rarely in the malignant growths.

*Diagnosis.*—If the tumor has infiltrated the bladder wall, palpation through the rectum in the male or through the vagina in the female,

will disclose it, provided the infiltration is extensive. If not extensive this method proves negative, because it may be so superficial that it can not be felt.

On the other hand cystoscopy gives us positive and reliable results. It is in diagnosticating tumors of the bladder that the cystoscope has proved so triumphant. Usually it requires only a glance to determine their presence. known beforehand, they are frequently undiscoverable.

For determining the site of villous growths, which, by the way, are seen as beautiful fantastic creations, apparently growing upon a sandy shore, the irrigating cystoscope should be employed because its stream causes a continuous change in the field of vision, thereby facilitating our study of the condition and




Further, we actually see the tumor, its size, shape, and location and whether it is villous, pedunculated or sessile.

It is an object of much attention for us to bear in mind that unless the exact location of every villous tumor is definitely determined by cystoscopy, before operating, some of them will be overlooked.

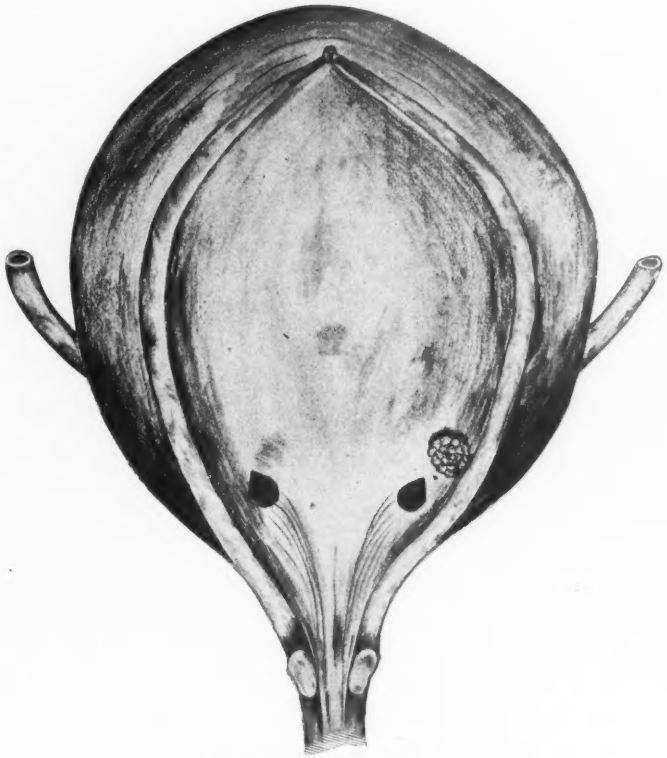
We know that many of them may be seen floating in the liquid medium, yet when the bladder is opened, unless their location is locating of the tumor's pedicle, and which is of great value to us subsequent to operation.

While it is generally true that we nearly always find vesical tumors situated adjacent to either the mouth of the urethra or one of the ureter openings, nevertheless, it is advisable for us to employ both the direct view and the prismatic cystoscopes to avoid the possibility of error.

For examining the base and posterior wall of the bladder, an instrument of the Cabot

type is to be preferred. For examining the fundus the Bierhoff-Frank irrigation cystoscope or the Otis observation cystoscope is more desirable, while if the interior wall and prostate are to be examined the retrograde cystoscope will serve our purpose best.

The characteristics of many of the different vesical tumors, as seen through the cystoscope, have been very beautifully reproduced for me from cystoscopic photographs by Mr. S. J. Bernolak, who has taken sufficient interest in this line of work to examine with me some of the pathological changes occurring in the bladder. The interior of the bladder and its contents are easily photographed by attaching a miniature camera to the ocular end of the cystoscope. Perhaps the Nitze and the Casper cameras, manufactured by L. and H. Loewenstein, Berlin, are the most serviceable, as they are detachable, and can be applied to any cystoscope. The Crammer Dry Plate Company, of St. Louis, manufacture plates which only require five or ten seconds exposure in a well illuminated bladder. Kodak films answer very well.



TUMOR OF THE BLADDER.

Case Mr. J. K. L. (Death from Hemorrhage.) Showing sessile papillamo near left ureter.

The different types of cystoscopes mentioned I take pleasure in handing you for your inspection.

If the tumor be in one of the ureters or kidney, and not in the bladder, and blood be

coming from it, the cystoscope will reveal the side involved, because the blood can be seen issuing from the ureteral opening of that side. Moreover, the ureters are easily catheterized by those of us who have given such work the requisite time and patience, and in this way only the urine from either kidney may be studied separately.

Cystoscopy, when performed in a diseased bladder, also obtaining the separate urines by ureteral catheterization, calls loudly for a professional cystoscopist, and in the hands of a neophyte the cystoscope is an instrument to be dreaded. One case is reported simply to accentuate its dangers when in the hands of an inexperienced person.

*Sessile Papilloma.*—Mr. J. K. L., age 58; married; occupation, clerk. About eight months ago patient discovered that he was passing clots of blood in his urine. His family physician, whom he consulted at that time, expressed the opinion that they were coming from the urethra. An internal medication was prescribed by his physician, and the blood and clots ceased about as suddenly as they had appeared. Urine remained clear until August 3, when blood and clots were passed three or four times daily for three days. Patient's physician ordered him to bed and prescribed adrenalin chloride internally, and irrigated his bladder daily with hot boric acid solution. Hemorrhage completely disappeared August 9 for a day, only to return in greater quantity the following day. His attending physician at first suspected the prostate as the probable cause of the hemorrhage, but as the prostate was about normal in size he was at a loss how to account for the hemorrhage in this connection. In his efforts to diagnosticate the cause he attempted to use an air dilating cystoscope, with which he was unfamiliar, and with which he stated he was unable to make out anything. Unskillful cystoscopy aggravated the hemorrhage, and it had become serious. It was at this juncture that I was called into consultation. From all the data the physician was able to supply, I reasoned by exclusion, that in all probability the patient had a villous tumor. The next day his physician returned to my office, stating that the patient's vitality was beginning to fail and that he was fearful of losing him. An aluminum sulphate irrigation was recommended, stating that if it failed to do good, a supra-pubic cystotomy was the patient's only chance. To this the physician stated that he did not think the patient was in condition to stand a general anesthetic. I suggested local anethesia, which had not occurred to the doctor, he remarking that that threw a new light on the situation. Over two days were lost before the family consented to the operation; meanwhile patient was still passing clots and blood. A supra-pubic cystotomy under local anesthesia was performed. The bladder was swollen, protruded considerably above the pubic bone, and was suggestive of the gravid uterus. Over two pints of clotted blood were removed. Bladder was irrigated with a hot saline solution and packed with gauze wrung out in adrenalin chloride solution. Up to this time the patient had stood the operation well, but a quarter of an hour later a "sledge-hammer" pulse came on, when the patient became irritable. No noticeable change for the next two hours, when the patient steadily declined and died—four hours after the operation. By the aid of a small incandescent lamp introduced through the supra-pubic incision, the autopsy disclosed a sessile papilloma, nearly the size of a dime, located about an inch to the left of the left ureter, and which was not observed in the hurry of the operation.

To my mind this case illustrates very forcibly three important points: The danger of delay in desperate hemorrhage. The danger in clumsy cystoscopy. The danger in overstimulation from adrenalin chloride, particularly in a bladder that has lost its tone.

TREATMENT.

Palliative measures, which have for their object the relief of hemorrhage, pain and dysuria are, in the vast majority of cases, simply a waste of time. And at best they are only temporary. Our sole aim, in handling these cases, should be the removal of the growth. To accomplish this we must resort to surgical means, and the sooner these growths are removed the better.

There are two routes to the bladder, the perineal and the suprapubic.

The chief objections to the perineal incision are: (1) that the bladder can not be inspected, (2) the operator is too crowded for space, and (3) in cases of enlarged prostates and deep perinaeums, the bladder is reached with difficulty.

The suprapubic route is the one of choice and may be performed by the two-step method, if the cystitis is marked. Folen Cabot is a great believer in this two-step method for suprapubic prostatectomy when the bladder is foul and the patient run down. The first step in this operation is to simply open the bladder and drain and irrigate until the bladder becomes fairly healthy. The second step is the removal of the growth. Sometimes it requires as much as two months' time to get the patient in condition for the second step in the operation. The advocates of this method reason that the patient can stand two light blows, but not one hard one.

I have purposely refrained from describing in detail the various methods of removing these tumors, once the bladder cavity is reached. Suffice it to say that these methods are:

(1) Excision with scissors or scalpel and suturing and searing the membrane.

(2) Torsion or crushing them off with forceps or ecraseur.

(3) Curetting.

(4) Application of the actual cautery alone.

(5) Sometimes a combination of these methods.

This treatment, of course, requires suprapubic cystotomy, and would be impractical by the perineal route. As these operations have, from time to time, become more and more perfected; the high route has steadily gained in popularity. In this connection I desire to mention briefly a new suprapubic operation —new to the writer—which I recently saw done by Professor Felix Legueu, of Paris. The suprapubic incision, down as far as the bladder, was done in the usual way. When the bladder was reached it was opened *transversely,* and its cut surface stitched with retaining sutures to the abdominal incision, which was, to all practical purposes, a delivery of the bladder. The method is of great advantage, because it gives a comparatively spacious field to work in. At this particular operation, which was for a tumor of the bladder, the base of the tumor (pedunculated) was ligated with as many chromicized sutures as was necessary, and the tumor was then removed with scissors, and the mucous membrane approximated with fine catgut sutures. The bladder was closed, also the abdomen, without drainage.

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Bibliography: Bland-Sutton, Yeyes, Lowenheim and Morris.

# THE PROBLEM OF RELAPSE AFTER APPARENT CURE IN THE TREATMENT OF PULMONARY TUBERCULOSIS*.

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All physicians who have treated tuberculosis have at times been discouraged by the occurrence of relapses in cases which had attained apparent cure, and this occurs with sufficient frequency to have led many doctors to doubt the possibility of permanent cure in this disease, and such an impression is sufficiently common to justify us in studying the facts in the case.

Relapses occuring in the course of the treatment of pulmonary tuberculosis may be divided into two classes. First, those occurring suddenly, usually after an acute sickness or after pregnancy, and these are generally fatal; second, those coming on gradually, without any apparent cause—this type being usually capable of arrest. The first are unusual or unavoidable and can here be neglected. The second are common, usually avoidable, and are those to which I shall devote my attention.

If we are to rightly understand such relapses, it is desirable to call to mind the pathology of the tuberculous process.

The pathological change begins as a result of the irritation of the fixed tissue cells and endothelia by the toxins of the bacillus and also, as claimed by some, through the mechanical irritation of the presence of the germ. As a result a collection of cells is formed at the seat of this irritation, the majority of which are of the so-called epitheloid type, though a certain proportion, and especially those at the periphery, are lymphoid cells.

The former, whose origin has been the source of much controversy, are today believed by the best authorities to develop from the capillary endothelia, from the connective tissue cells of the alveolarsepta and from the pulmonary alveolarepithelium, and they are the foundation of the tubercle. Lymphoid cells are round cells of the type of lymphocytes, and emigrate from the blood vessels. In the center of the tubercle there are also usually found one or more giant cells—large cells with many nuclei and with the protoplasm tending to necrosis. These are supposed to develop from the epitheloid cells by neuclear division, and to some extent by the welding together of several cells. The neuclei tend to arrange themselves in a concentric row around the periphery or in a collection towards one pole, and such cells usually contain numerous bacilli.

The surrounding alveoli, if the tubercle be in pulmonary tissue, show desquamation of their epithelia and deposit of fibrin. The fibrin net work existing between the cells of the tubercle should also here be noted; whether this results from coagulation of fluids in the tubercle or from branching of the cells, is not as yet finally determined.

The central cells of the tubercle thus formed show a tendency to undergo a type of coagulation necrosis, partly owing to the effect of the tubercle toxines and partly to the absence of blood supply, the tubercle being avascular. As a result of this necrosis a focus of caseous matter, containing dead and living bacilli, is formed in the centre of the tubercle, while scattered between and in the epitheloid cells are numerous active germs.

Such caseation is a natural result of the advance of the germ, and in an active and ad-

*Read before the Mississippi Valley Medical Association, Louisville, Oct. 14, 1908.

vancing process this change tends to spread to larger and larger areas, the softened pultaceous matter being evacuated as soon as it can gain access to a bronchus and leaving behind excavation. Such are the results of the natural development of the germ, but fortunately, as in all infectious diseases, there are two factors active in the process, one, the germ—destructive and harmful if unopposed; the other, the cell—constructive and protective to the body if rightly supported, and when by proper measures the vitality of the body, and therefore of every cell in it, is raised, we find these cells combating the advance of the diseased process, through a tendency inherent in them, in the presence of a not too overwhelming irritation, which we call fibrosis.

When the resisting power of the body is sufficient, the peripheral cells of the tubercle tend to elongate and to build a wall of connective tissue around the focus of irritation. This connective tissue shrinks, shutting in the caseous matter in the centre, which slowly inspissates and dries, and finally tends to become calcareous through a deposit of lime salts, and where this process is complete and the whole of the tuberculous zone, and not a portion as is sometimes the case, is thus walled in, the disease is at first arrested and, as time passes and the fibrous wall becomes stronger and the contained bacilli slowly die out, it finally becomes cured. There is no more beautiful example in all pathology than this of the "Vis Medicatrix Naturae," and the findings in any autopsy room show us of how often such cures are final and complete. We must not forget, however, that at first, and for some time after, what is called "apparent cure," the wall of fibroid tissue is only moderately resistant, and that it demands a persistent maintenance of high vitality and proper conditions of life on the part of the patient, if this wall is to become a secure prison for the germ, and when, either through ignorance or stupidity or poverty, the proper conditions are not gotten, the wall, deprived of its resisting power, can again break down, and like a Pandora's box, scatter throughout the lung its noxious contents. However, if health is maintained at the normal level for from two to three years after apparent cure, we can justifiably assume that a complete cure has been reached, and after such a probationary period, safely passed without any reawakening of activity, cases in which relapse occurs will be rarely found.

Aside from this local healing process, it must, however, not be forgotten that the lowered resistance of the whole body must be removed; this being just as important as the local cure, the patient who is said to have recovered but remains weak, pale, flabby, or of poor resisting power, being very likely to hear again from the trouble.

Cure is thus seen to depend on our ability not merely to raise, but to keep raised, the vitality and resisting power of the patient's body both locally and generally, and while not only the resisting power of the cells, but the virulence of the invading germ, are active in a relapse as in a cure, the latter is so little under our control as yet (though tuberculin offers promise in that line) that it is to the former that our attention must be chiefly turned.

Turning from this brief consideration of the pathology of the process, to its clinical aspects, its extreme importance is only too often made plain to the physician. Nothing is more disheartening to the patient or disappointing to the doctor than to have a case, after a period of apparently successful treatment, either in his own home or in a resort, and who has been discharged as "apparently cured," and who too often supposes that this allows an unguarded return to ordinary methods of life, relapse, after all too short an interval, into his previous condition. He has gone home with all symptoms removed and with signs of a quiescent lesion, to resume his oc-

cupation with bright hopes. At first he feels very well and is tempted probably to overdo—slowly and gradually, in from six months to a year, he begins to drop below his normal weight and to lose appetite, and feels unduly languid. Then cough returns, soon followed by a slight expectoration, and before long fever or sweats reappear, and the poor man realizes that his hopes were premature, and that he is again in the clutches of the disease he thought he had thrown off, and is only too apt to give up hope and abandon the fight in despair. Yet I am satisfied that as by degrees the treatment of tuberculosis becomes better and more generally understood, and doctors become better teachers, such relapses will become fewer and fewer, and it will be rarely that a case brought to apparent cure will relapse.

However, if this is to be so, the profession will have to have a better realization of their duty towards their tuberculous cases and, keeping ever in their mind the nature of the process they are fighting, they must make their patients realize that their lives, after they give up regular treatment, must be no less careful and thorough than during that time, and that their ability to retain health will depend largely upon their own intelligence and persistence.

However carefully handled and taught the patient may be, however, perfect the care with which he is watched, a cure can not be obtained without ample time, nor can anyone be expected, in a few months, to completely encapsulate with a strong fibrous wall, and arrest, so obstinate a process.

Speaking broadly, apparent cure, according to the classification of the National Association, demands from a minimum of six months up to three years of time; one year to eighteen months being a fair average if the case be taken early enough, and the patient must never be allowed to forget that this must be followed by extremely careful and restricted life for two or three years, and with caution forever.

On the other hand, it matters not how much time is taken by the patient if proper care is neglected, if the doctor does not teach thoroughly and watch the life closely, if the case is allowed to live very much as it wishes, with only enough care to salve his or his careless doctor's conscience, he may, indeed, apparently recover, but he is certain very shortly to relapse.

How often do we see patients return home and either through the poor teaching they received, or through their own strong-headedness, resume the very methods of life which originally produced their break down, and which now, more than ever, will inevitably have disease as their result.

Unhygienic and improper methods of life which lower the general vitality, and thus the resisting power of the newly formed connective tissue, may undo all that has been gained. We have all seen, I am sure, cases whose vitality was such that despite their folly, they were able to attain, not one, but many arrests of the process, the patient returning each time with less strength and fighting power than he had before, and finally succumbing to the fight.

Some have sense enough to be warned by two such recurrences, and remodeling their life as they should, finally recover. But such are few. Dr. Theodore Williams, of London, at the recent International Congress of Tuberculosis in Washington, cited an unusually striking case of repeated arrests, where a consumptive went from London to Panama, in search of health and, doing badly there, as was to have been expected, went to the mountain regions of Peru, where he made an excellent recovery, not once or twice, but several times. This man, who could not learn from experience, returned to Panama, taking refuge again in the Andes after each relapse, until after a number of years of such folly, nature, indignant at his stupidity, ceased to come to his assistance, and he succumbed.

CAUSES OF RELAPSE.

Considering in detail the causes for relapse, they can be divided, first, into those which are due to the fault of the patient, and second, those for which the doctor is responsible.

Taking up first the former, I would place first in importance the patient's character. I have very recently dwelt fully on the effect of the character on the patient's chances of cure (*) and here I would only note that lack of will power, of determination and grit, lack of intelligence or purposefulness, and lack of self-control, make it likely that even if such a person succeeds in obtaining apparent cure, he will relapse where, had these qualities not been lacking, he would have resisted. The good effect of a cheerful temperament should also be noted, patients tending to melancholy and depression being severly handicapped, while great family griefs—such as the loss of a dear child—are often fatal in their results.

The second harmful influence I would note is that of certain infectious diseases, especially grippe, measles and typhoid, which are very apt to reawaken an encapsulated process.

Thirdly, most important in relation to recurrences, are the patient's mode of life and his actions . (a) Overexertion is perhaps the commonest of these, whether it be in business, society, sport or study. Business must be resumed gradually, with a proper interval for rest before and after the midday meal, and former habits of unduly close application must be altered, work not being begun too early in the morning nor continued too late in the evening. I consider it very important that fifteen minutes' to a half hour's rest, recumbent if possible, be taken before eating the midday and evening meals, and that the same amount of time be spent quietly following the meal, and the faithful following of this rule will enable many cases to do effective work without bad results.

Social duties must be resumed very cautiously, and night entertainments almost entirely given up, while dancing should never be resumed, the late hours, dancing, etc., demanded by society not infrequently undoing months of most careful work. Tennis, bowling and other violent sports often produce very bad results and should be tabooed. Carefully graduated exercise, of course, is of the greatest value for these cured cases, but for a few months at least it must be very carefully limited, and *carte blanche* not given until we are fully satisfied with their condition.

Study must be resumed with great care and with caution as to the ventilation of places of work and the hours of work.

(b) Underfeeding and unwise diet is another common cause of relapses, and this not merely in the poor, who can not get the needed food, but even at times in the well-to-do, who can. It is almost needless to say that cured cases must choose their food carefully with regard both to its nutritiousness and palatability, and must remember that they have got to eat to live. Among the well-to-do, overrich food and fancy cookery, if it takes the place of simpler and more nutritious things, can be harmful. Especially important for those who must work is some light nourishment between meals, and I believe that this is even more necessary at this time than during treatment, if the strain of occupation is to be stood. A milk shake is easily and cheaply gotten by almost any one and, taken at eleven and four, its effects in preventing exhaustion are wonderful.

(c) Dissipation. One would think that no patient who had recovered from tuberculosis would ever be willing to indulge his appetites or passions unduly, but such, unfortunately, is not the case. The old jingle "The devil was sick, the devil a saint would be," "The devil was well, the devil a saint was he," expressing exactly the facts in a majority of cases, and not a few of the relapses we see

*International Congress of Tuberculosis, Washington, October, 1908. Paper on Home Treatment.

are due to the resumption of milder or stronger dissipations.

(4) Next to the patient's acts and character should be noted his surroundings. (a) Want of fresh air. If the case is well trained and not too poor he will never consent to return to closed windows and stuffy rooms and houses, but all are not well taught, and it need hardly be said that a return to a home with closed windows and furnace heat in the sleeping room, or to an ill-ventilated, dusty place of business, is sure to be paid for sooner or later. Again, the harmful effects produced by family cares, neglectful or irritable husbands, nagging or scolding wives, and spoiled or sick children, are often seen, and deprive the patient of that rest during his or her hours at home, which is so important. These troubles are not confined to any class of society, and are with difficulty removed.

In the poor, the return to dark, unsanitary quarters in the slums, or to overwork in unventilated workshops, with long hours of work and little food is disastrous, and as I have recently said, money spent in seeking cure for this class of cases is practically wasted, and hence I believe that among the ignorant or criminal poor, the treatment of tuberculosis is rather a matter for the sociologist and civic reformer than for the physician.

Turning to the other cause for relapses it is unquestionable that some are due to the fault of the doctor. Too few physicians realize that a case, however much improved he may be, who is allowed to live very much as he pleases, and who is sent home uninstructed as to the details of his future life, is, as I have already noted, very sure to relapse, and is, in any case, a discredit to his physician.

Indeed, a patient is far more likely to recover who is discharged only moderately improved, but thoroughly trained, than one who is greatly improved, but untrained, for the former will know how to complete his cure in his home.

The doctor must be a good teacher, and he must so impress his teachings upon his patients that they will learn automatically to do the right thing, for unless this be so they are pretty sure sooner or later to forget and do the wrong one.

Next to improper teaching, the other fault I would note on the part of the doctor is too early a dismissal of the case, before it has reached a point where it will be able to maintain the progress made.

As already noted, the cure in tuberculosis is slow, just as is the development of the disease, and demands ample time. Such early dismissal is usually due to the patient's impatience, the doctor foolishly letting himself be brought to giving a grudging consent to a resumption of business when his best judgment tells him that it is unwise, but like the unjust judge in the Bible, he yields to much importunity, and I, like every doctor, have lived to regret such weakness.

Again, too early dismissal may be due to an undue optimism on the part of the physician who is tempted too early to see the good results he is hoping for, while in a few cases it may result from an underestimation of the severity of the process he is treating.

In regard to curability, cases can be divided into three or possibly four classes. First, those who can return to any climate and to their former life, always modified by proper hygiene. Second, those who can remain in small country towns or in the country with lessened work, but can not live in large towns again. Finally, those who can remain well only on condition of staying in some specially favorable and suitable climate. I have seen not a few of these cases, who would remain well and strong and able to work while living in Asheville, but who on several trials always relapsed when they tried to work elsewhere. I might also note that there is a class of cases which, while not curable, can greatly arrest the advance and activity of the process by living in

a climatic resort, such cases often adding from five to ten or more years to their life by this means, although the disease all the time slowly progresses.

In all, wise living, care and remembrance of the lessons the doctor has taught them, is the price of continued health, and the physician should always be careful to have a last talk with each patient, impressing upon him finally the lessons he has already received, and making him realize that his recovery is always conditioned on their application to his daily life. Such a patient can be compared to a man who has failed in the financial community, but who has reestablished his credit. His standing with the bank may indeed become very good, but let the banker but hear that the man is living fast or beyond his means, and he will quickly enough call in his notes.

In brief, therefore, it is clear, that if relapses are to be avoided there is need both of a careful doctor, able to teach, impress and dominate his patients, ample time for the attainment of apparent cure, and a fatihful, determined, teachable and intelligent patient, willing and able to learn and to carry out a correct mode of life.

On discharge, the patient must not merely be afebril after test walks, but must have a normal or hyper-normal weight and nourishment, a nearly normal pulse, a normal or nearly normal strength, almost no, or no cough, no expectoration, unless possibly a little of a mucoid nature, and a normal appetite; add to this proper instruction, proper living, and from time to time a careful, thorough look-over by a competent physician, and we will find that our percentage of relapses gets smaller and smaller and our views on the curability of pulmonary tuberculosis more and more hopeful.

Finally, in any consideration of the subject, it should be noted that today the most conservative and experienced of our workers in this line, notably, our honored head, Dr. Trudeau, consider that it is highly probable, although not yet fully proven, that a case of tuberculosis which, aside from its hygienic and dietetic cure, has, where it is indicated, undergone a course of tuberculin treatment, while it will probably not show any difference during its treatment from a case which receives hygienic treatment alone, will show a lessened tendency to relapses, and that the percentage of permanent recoveries in such cases is probably increased.

Since we are probably at the commencement of a new wave of tuberculin treatment, if we may judge from the recent International Congress, let me here say that however valuable this treatment may be, and I use it with benefit in carefully selected cases, it will never make one whit less necessary the hygienic treatment and the thorough teaching of our patients, and that if it tempts the doctor through faith in its efficacy to neglect these things it will prove to be not the blessing which I believe it is capable of being in some cases, but a curse.

65 French Broad avenue, Oct. 14, 1908.

# CONCLUSIONS BASED UPON OBSERVATION OF FIVE HUNDRED CASES OF FRACTURED SKULL.*

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During the past seven years, while engaged in work at the St. Louis City Hospital, opportunity was offered for observing several hundred cases of fracture of the skull. All classes of fracture and injury were met with, and among the number were many interesting and remarkable cases. In treating the subject, it is intended rather to convey impressions or conclusions that have been formed from an experience with this class of cases than to enter into a statistical study.

In order to obtain a definite understanding of fractures of the skull it is necessary to study these conditions at the autopsy table and in the operating room. Valuable points of surgical and neurological interest may be gathered in this way, and one is often surprised to learn that lesions apparently insignificant and giving little visible indication of trouble have been the cause of such profound and serious symptoms. It becomes necessary at once to differentiate between those injuries which are epidural in character and those which primarily or secondarily affect the brain and its coverings. The brain, when injured, may be subject to contusions, lacerations, hemorrhages, softenings, œdema, anæmia and to nutritional changes.

In postmortems the gross changes, due to hemorrhages, softening, œdema, etc., are easily noticed, but alterations in the more minute structures are often overlooked and the brain is considered normal when in reality it has been the cause of grave symptoms. It is very probable, as Phelps (Ann. Surg., Dec., 1906,) has indicated, that nutritional changes in brain structures are often the result of injury to the organ, and that these changes are of such a complex nature that a definite neurological picture can not be obtained. This observation seems an important one, for it serves to explain the trouble in many cases, and should always receive consideration from the standpoint of prognosis and treatment. Apparently these nutritional changes, as a result of trauma, may be confined to localized areas of the brain independent of gross lesions, just as if they were brought about by pressure.

Fracture of the skull by contre-coup is well recognized, but the fact that the brain may also be injured by contre-coup is not sufficiently appreciated, and not infrequently softening or abscess of the brain develops on the side opposite to the injury on the skull. Contusions of the brain, with resulting effusion of blood or of serum and œdema, are a frequent accompaniment of fracture of the skull and may be present even without fracture. At operation the subdural space often contains fluid under pressure, which fluid may be bloody or clear in character.

Where there is epidural hemorrhage, the clot which forms may cause considerable compression of the brain. If the clot or blood is removed soon after the receipt of injury, the brain thus compressed may react, regain its former shape and show pulsation. If, however, compression has existed for some time, the brain, in most cases, does not react, the

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area of compression remains, the dura becomes flaccid and pulsations are usually absent. In operations shortly after the time of injury the blood and clot may be easily removed, and it is often forced out through the trephine opening by the intracranial pressure. In operations that are deferred to a later period, the clot is found to be less easily removed and often becomes densely adherent to the dura.

Where compression of brain tissue is more or less acute and is permanent, the brain usually does not react, and destruction of brain tissue and impairment of functions result. Where the compression is gradual and of a chronic nature, the brain may be given an opportunity to react and the lesions become more localized.

It is evident that the symptoms of fracture of the skull depend rather upon involvement of the brain than upon injury to the cranial bones, and in all cases of fracture or of suspected fracture of the skull, a careful neurological examination is demanded. While the neurological findings are important, they are not always reliable or conclusive as indicative of the location of injury, because often in injury to the skull and the brain the lesions are of a complex nature and are multiple, or they may be remote from the seat of injury. The external evidence of fracture of skull may be slight, and yet later the patient may show grave symptoms of injury. In most cases where there is fracture and the patient is conscious, pain may be elicited over the site of fracture, though hematoma or other evidence be lacking.

The symptom of pain on pressure over an area of the scalp, especially in older and in doubtful cases, is an important sign, and frequently indicates linear fracture of the skull. Hemorrhages into the orbital tissues are frequently mistaken for "black eye," and the direct result of external violence, when in reality they are due to fracture of the skull. Sometimes a "crack-pot" sound may be elicited by percussion, especially when the skull itself has been laid bare.

When the body has been the active agent in producing a fracture, such as would occur in a fall from sufficient height, the symptoms are usually pronounced, while in many cases in which the body has been passive and the fracture is the result of a blow, the initial symptoms may be very insignificant. In certain instances the bony structure is of sufficient resistance to permit little damage to the skull, the force being spent so as to damage principally brain structures, while in other cases the skull is the chief seat of injury, the force of the shock affecting the brain but little.

Fractures of the skull, especially when the base is involved, are usually accompanied by mental disturbance, and in serious cases the patient is unconscious or semiconscious. Unconsciousness coming on shortly after injury is only of relative value, and is not always indicative of the seriousness of the injury. If unconsciousness is followed by a period of consciousness and later again by unconsciousness, it usually indicates that there is serious brain disturbance. With a patient having the advantage of rest, and if consciousness be followed by an unconscious period, the symptom should be regarded as an important one of serious injury. Unconsciousness and confusion of mind often come on as a result of slow hemorrhage or breaking down of brain tissue, and such patients may be restless and appear drowsy, stupid and apathetic. In children, when the head is injured, convulsions are not uncommonly met with, but may be no indication of the seriousness of the injury. In adults status epilepticus is sometimes encountered, which should be seriously regarded when it occurs shortly after injury.

Serious fractures are accompanied by shock and in the early stage the body temperature is normal or frequently subnormal. The pulse

is more frequently slow, full and strong. The respiration is often but little altered, except in moribund cases, when it is apt to be labored or stertorous. Vomiting may occur in many cases, and in unconscious cases there is frequently difficulty in swallowing. Where the injury is localized the neurological examination is of great value in eliciting focal symptoms.

In all cases of head injuries and resulting mental disturbance, it is important to know whether or not the skull has been fractured. The knowledge of an existing fracture of the skull is of distinct diagnostic value. The diagnosis may be arrived at by methods of neurological examination or by ocular demonstration. In lacerated scalp wounds the nature of the fracture may often be demonstrated. In fracture of the base there may be bleeding into the orbital tissue and from the nose, mouth or ears, but in these instances careful examination should be made to exclude hemorrhage of these organs from other causes. The demonstration of cerebrospinal fluid is evidence of fracture of the skull. Where the scalp is intact, exploratory incision over hematomata or painful areas is indicated as strongly as are exploratory punctures or incisions for purposes of diagnosis of conditions in other parts of the body. Exploratory incision often gives additional and valuable information, and as a rule the periosteum is found to have been loosened if fracture is present. The location and the direction of lines of fracture and the extent and the nature of the injury to the skull may serve to explain many of the neurological symptoms.

If the brain is uninjured, the neurological symptoms may be wanting, and the diagnosis must be based upon direct examination. It is important to differentiate between concussion, contusions or other injuries to the brain, and those symptoms which are the result of compression due principally to hemorrhage. At times, however, this is impossible, and certain cases with symptoms of contused brain can not be diagnosed from those in which there is hemorrhage with compression. Spinal punctures have a certain diagnostic value as an index of the character of the fluid and the degree of tension.

Great difficulty may be encountered in determining the source of a suspected hemorrhage, because focal symptoms which are present when the hemorrhage is small and localized disappear when the hemorrhage increases and the brain becomes more extensively compressed. As the symptoms of compression increase, the patient may pass from a condition in which the mind is confused to one of unconsciousness.

In the early stages of fracture of the base there may be shock, subnormal temperature, slow and full pulse, regular or labored respiration, vomiting, visible evidences of fracture, unconsciousness, restlessness, and in general diminished or altered reflexes.

Intracranial pressure in the early stage may be chracterized by impaired mental state, restlessness, regular respiration, a full pulse and reflexes pointing to focal symptoms.

In fatal cases, and in later stages of serious cases of fracture, the temperature may be elevated and the volume of the pulse diminished. In uncertain cases it is important to differentiate fracture of the skull from uraemia, apoplexy and alcoholism.

In cases of fracture of the skull the prognosis should be guarded, at least for the first few days. Cases seriously injured and suffering from shock usually die within forty-eight hours. Certain cases do well for a few days and then suddenly and unexpectedly die. The prognosis is much worse when subdural complications exist, than when the injury is extradural. Injury to the dura mater may lead to serious complications. Unconsciousness in itself is not of much value as an indication of the patient's condition, but when the reflexes are present and about normal the

prognosis is good. In those cases that react the pulse and temperature remain nearly normal, but when the volume of the pulse diminishes and rate is increased and there is decided elevation of temperature, the prognosis is very bad and a fatal issue usually ensues.

In the treatment of fracture of the skull we should distinguish between surgical and neurological indications for operation. The neurological signs may not be pronounced, yet surgical intervention be distinctly indicated, while on the other hand the surgical aspect may not be emphasized, and yet the neurological findings be definite and conclusive. The neurological condition being subject to changes it is demanded that the patient be kept under continuous observation. When possible, the scalp having been properly prepared, the existence of the fracture and its nature and extent should be determined by exploratory incision, if necessary. Simple linear fractures of the vault, when not causing complicating symptoms, require but little surgical treatment. In depressed fractures the depression should be raised, and all pressure on the dura mater should be removed. When the depression is complicated by comminuation, effort should be made to retain fragments, so that the bony deficiency may be limited as much as possible. Examination should be made for epidural hemorrhage and clot, and, if necessary, drainage instituted. By puncturing the dura the character of the cerebrospinal fluid may be ascertained. If the dura has been injured, it should usually be sutured if possible, and if bulging of dura is due to tension of the cerebrospinal fluid, this may be relieved by spinal puncture. Depressed bone should always be elevated or removed, since pressure and irritation are frequently the cause of convulsions.

The operation should be directed primarily to the relief of brain compression, which may be due to hemorrhage or to blood clot. As a rule, the sooner the blood or clot causing pressure is removed, the better will be the prognosis, and when removed the danger of sequelæ may be avoided. Moreover, old clot is removed with greater difficulty. If large accumulations of blood and clot causing compression are not early removed, the brain will not react and death may result. Therefore, when signs of compression are present, early operation is indicated.

In doubtful cases where the symptom complex of the neurological findings is such that focal symptoms are lacking, exploratory operations are indicated, and it is often better to explore than to wait for symptoms, which, when they become manifest, are the result of brain compression and the destruction of brain tissue.

With improvements in methods of technique, the danger and complications of operation will be lessened, and the indications for early cranial surgery in doubtful cases may become as urgent as they are in doubtful intra-abdominal conditions where laparotomy is resorted to. While it is usually better to explore early than late, in a certain class of doubtful cases it may be better to wait, the time for operative interference being indicated by a rise in temperature and diminished blood pressure. In fractures at the base, where the symptoms point to nutritional changes and extensive destruction of brain tissue, operation is not indicated, but where there are distinct signs of hemorrhage and pressure, operative procedure, with drainage of the middle fossa, has given good results.

Bone deficiencies are often an annoyance to the patient when recovery takes place and, therefore, when time is not too great a factor the bone flap operations are to be preferred. In cranial surgery of an emergency character, additional shock should be avoided, and the control of hemorrhage and the duration of operation are important factors.

Experience has shown that in compound

fractures and in injuries to dura or brain thorough drainage of the wound is important.

Aside from elimination and remedies influencing blood pressure, therapeutic measures seem to be of little value in fracture of the skull. In all cases rest is important, and patients should not be allowed to get out of bed for a number of days.

## CONCLUSIONS.

Linear fractures of the vault usually do not require operation, unless they involve important vessels or sinuses.

In depressed fractures, the fragments causing compression should be elevated or removed.

Experience has shown that in compound fractures, especially where there is injury to dura or brain, drainage of the wound is usually desirable.

Operation for fracture at the base is indicated where hemorrhage is extradural, and where there are signs of compression. The middle fossa is most frequently involved, and drainage here can be easily instituted.

The practice of examining hematomata by means of exploratory incision when reasonable precautions are taken is practically without danger, and often gives most valuable information as an aid in diagnosis.

The neurological findings are of value in determining focal symptoms, but when complex brain disturbances exist they may be unreliable as diagnostic aids, and require special interpretation.

Brain compression is a positive indication for operation, and, as a rule, the sooner compression is removed the better the prognosis.

At operation shock and hemorrhage are factors that should be carefully regarded, and operation should be done as speedily as possible.

In doubtful cases, where it is probable that the symptoms are caused by brain compression, exploratory operations are indicated.

The expectant treatment is to be advocated in those cases in which there are no symptoms of brain compression, in which the temperature and pulse remain nearly normal, and in which the reflexes are but little altered. Unconsciousness in itself is no index of the seriousness of the trouble.

Operation is contraindicated in those cases in which the symptoms are the result of intrinsic destruction of brain tissue, when the temperature is high, where the pulse is rapid and the blood pressure diminished.

The importance of a longer period of rest in bed should be more strongly emphasized, so that the danger of secondary complications may be avoided.

# REPORT OF A CASE OF ILEUS CAUSED BY A UNIQUE ENTEROLITH.*

BY DR. CHAS. H. CARGILE, BENTONVILLE, ARK.

Mrs. K., of Maysville, Ark., age 42, married, mother of several children, pregnant five months; patient of Dr. J. T. Powell.

Clinical history: Five or six days before my visit, Nov. 11, 1907, there had been diarrhea. During the last four days the bowels had not acted, notwithstanding enemas had been freely and frequently given. Frequent vomiting had characterized this period. The vomitus had been stercoraceous for forty-eight hours. Hyper-peristalsis, tympany, griping, tenderness, restlessness and rapid breathing were conspicuous. Temperature normal and pulse 110.

Considering the history and delay her condition was tolerably good. It is proper to state that this delay was not Dr. Powell's fault, for he had in due time urged resort to surgical means.

The ileum, that is the part that was easily accessible through the incision, was distended and much discolored. With part of the hand in the abdomen there was felt in the left iliac region a hard mass, which when brought into the incision was found to be in the ileum and very completely occluding its lumen.

Notwithstanding manipulations that were painstaking, the more so because of the distended and discolored conditions above the obstruction, the bowel ruptured before it could be aspirated. This wound in the intestine was sutured instead of being enlarged for the removal of the lith, because the latter was about ten inches below and so tight in the gut that it was not thought prudent to try to move it so far.

Perhaps it is proper to state that this rupture, though in part due to the friable and distended condition of the gut and to the pressure to which it was subjected in the incision by the underlying pregnant uterus, could possibly have been avoided by a larger incision. Be this as it may, barring the abortion that occurred on the second day and some infection, the patient made a slow but good recovery.

The enterolith was about the size of a small hen egg, but now, after shrinking, as you see, not half so large, and composed mainly of persimmons that had been eaten about two weeks before.

Investigation in the surgeon general's office fails to reveal another enterolith of which persimmons were a component part. Hence the term "unique enterolith" in the title of this paper.

The claim for uniqueness may be questioned by some of the members of this association, who two years ago heard me report a similar case and saw the lith. That one, like this, was composed mainly of persimmons, but was removed post-mortem from the stomach instead of the intestine—one a gastrolith, the other an enterolith.

The case of gastrolith above referred to has been recorded in the proceedings of the Arkansas Medical Society for 1900, and in Vol. IV of "Transactions of the Chicago Pathological Society," the concretion having been exhibited before the latter by Dr. M. Herzog, who made a brief report of it from notes I gave him.

In order that it may be recorded in medical literature more curent than these, a brief synopsis is appended.

*Read before the annual meeting of the Frisco Surgeons' Association at Kansas City, Mo., May 26, 1908.

In January, 1900, this gastrolith was removed postmorten from the 3-year-old son of Mr. J. W. Walker, who lives on Pea Ridge, in this State. I first saw the patient in my office about two weeks before his death, he having been referred to me by Dr. A. M. Gaines. The parents gave the following history: About nine weeks before, he vomited a quanity of persimmons, including many seeds. Every day afterwards until his death, he vomited more or less mucus, which usually contained small dark particles. A peculiarity of his vomiting was that frequently after swallowing once or twice at the beginning of a meal he usually ejected the food and some mucus, after which he would finish the meal with but little difficulty. His appetite was good, sleep sound, bowels regular and flesh not reduced. Indeed he was a healthy-looking child. Dr. Gaines had discovered a hard mass, the lower end of which occupied the epigastrium. The other extended obliquely upward and to the left, and so far under the costal cartilages that it could not be reached, even by much manipulation.

The next examination, made three days before the child's death, revealed nothing new, but caused me to repeat my former advice to have an early exploratory incision and gastrotomy, if found necessary. The parents indicated that they expected to act on my advice, but deferred for a few days.

Three days later Dr. Gaines telephoned me to meet him in consultation. His description of symptoms left little doubt that peritonitis had supervened. The child died before my arrival. Eighteen hours before death perforation had occurred, as shown by sudden and severe pain, followed by cold sweat, shock, vomiting, thirst, tympany, rapid breathing, etc. Dr. Gaines and I made an autopsy, which revealed diffuse peritonitis, much lymph in all parts of the abdomen, and more than a pint of serous fluid.

A perforation through which a pencil could easily be passed was found in the anterior wall of the stomach, near the greater curvature. Immediately under and corresponding with this, was a persimmon seed, whose edge projected above the surface of the concretion, and which, doubtless, was the cause of it. The prominence of this seed is not marked now like it was before the great shrinkage the calculus has undergone.

In the stomach was found much, perhaps several ounces, of a yellowish white substance, resembling curd. Some of this had escaped into the abdominal cavity.

Examining the mucus membrane, through the incision made for removing the mass, several small shallow erosions were found.

The stomach was so distended that when lightly filled with lint its displacing capacity was twenty-six ounces. Its walls were proportionately thin.

The pyloric constriction, or orifice, was entirely obliterated, it being impossible to make out the line of demarcation between the stomach and duodenum. Doubtless this was caused by the impinging of the smaller end of the concretion during the frequent vomiting.

This gastrolith, when fresh, was a most perfect cast of the normally-shaped stomach, and was made up mainly of persimmon seeds, pulp and peel, together with starchy matter. It was quite unlike what you now see.

One who saw it then would hardly recognize it now, being so much smaller. The unequal shrinkage of its constituent parts has made its surface uneven. It was five and three-quarter inches long. Its pyloric diameter was one and one-quarter inches, while its greatest (near the cardia) was one and three-quarters. Its weight has diminished from seven and one-half to one and one-half ounces.

Research in the surgeon general's office reveals the fact that at the time it was reported it, too, was unique. Two years later Dr. Oliver, of Cincinnati, reported a similar case of gastrolith before the meeting of the A. M.

A., 1902. His case was published in the journal of the A. M. A., Oct. 4, 1902.

These three cases prove that eating persimmons is liable to be followed by a condition that, though rare, is far more serious than the consequent indigestion that is occasionally observed. It is fair to presume that such cases have occasionally occurred ever since man began to eat this fruit, but that correct diagnoses were not made before the days of exploratory incisions.

As seeds were the constituents of the three concretions it may be surmised that if they be not swallowed the fruit may be eaten with impunity. This presumption is strengthened by the rarity of such liths notwithstanding the very common eating of this fruit, the seeds usually not being swallowed.

Two of the cases having occurred in children, who are less careful about what they swallow, help to this conclusion. It is surprising that such a large and hard foreign body remained in the stomachs for several weeks without more impairment of the general health.

In the case of the enterolith it is probable that originally it too was a gastrolith, and that after about a week it escaped into the intestine and by mechanical irritation caused the diarrhea at that stage. Its small size made the escape through an adult pylorus possible, but not so of the two much larger gastroliths in the stomachs of children.

In the case of the enterolith there were no symptoms during the week following the ingestion of the fruit, the diarrhea being the first.

As the intestinal lumen was completely occluded by it, it was impossible that it could have been in the intestine a week without symptons. The most remarkable fact connected with the subject is that two of the only three cases reported have occurred in the practice of an obscure "Arkansaw Doctor."

*Note* 1.—The interest that attaches to these concretions is increased by the fact that at the same meeting before which I reported the case of enterolith, Dr. A. M. Smith, of Cherokee, Kan., reported a similar case and exhibited the gastrolith composed mainly of persimmons.

*Note* 2.—Very soon I shall present these specimens to the Army Medical Museum at Washington, D. C.

# EDITORIAL

The Editor-in-Chief having had an accident, in which two ribs were broken, has been unable to furnish editorials for this number, and at his request the Managing Editors have filled his place in this edition.

## CHEMISTRY IN MEDICINE.

Surprising and startling statements, although untrue, awaken the mind to investigation. Members of the medical profession are frequently heard to say in medical meetings with reference to chemistry that they have never known anything about the subject and hope they will never know anything about it. Furthermore, that if a physician should happen to learn anything about chemistry the quicker he forgets it the better. The fresh medical student will also tell you that his preceptor advised him to give very little attention to the study of chemistry. This is all wrong, as can be shown by the facts concerning the association of the two subjects, for chemistry has been the handmaiden of medicine for centuries in the past. Never in the history of medicine has the necessity for the physician to have an understanding of the fundamental principles of chemistry been so great as at the present day.

Chemistry has been the companion of medicine since the time the Saracens invaded Egypt on their march of conquest across Northern Africa and finally into Spain. In Egypt their learned men studied the art of chemistry or alchemy, and used it in their research for the ever vanishing Philosopher's Stone. In searching and experimenting for the Philosopher's Stone many new substances were discovered, and many new compounds were made which finally made their way as remedies into the hands of the medical men of that time, many of whom were both alchemists and accomplished physicians. The Philosopher's Stone was such material as when properly used would change the base metals, iron, copper and lead into gold. This fact shows clearly why there was such a persistent search made for this material, and the persistent research explains why it is possible to have so many new chemical compounds discovered and formed.

Alchemy was the chemistry of the middle ages, in fact out of the work of the alchemist has grown the great science of chemistry. On account of many alchemists being also physicians chemistry and medicine were inseparably blended. Some of the compounds made and used by the alchemists were such as silver nitrate, nitric acid, ammonia, sodium sulphate and many others of like character.

One of the greatest physicians of the early times was Avicenna, (980-1037 A. D.) an Arabian, who, no doubt was as well acquainted with the writings of Geber, the greatest Arabian alchemist, as he was with the medical works of Hippocrates and Galen. His treatise on medicine, based chiefly on Galen, thus combining the two schools, Arabian and Greek, the Arabian, with its newly discovered chemical compounds through the research of its alchemists, and the Greek, with its wise philosophical teaching of Galen, "the Prince of Physicians," became the greatest text on medicine of the middle ages. It displaced the works of Hippocrates and Galen in the universities of Europe, and was used even until the end of the seventeenth century in the schools of Paris

and Montpelier. This text existed as an authority on medicine for nearly five centuries, and the work of the alchemists rendered no little aid toward its great success. Geber (776-A.D.) was the greatest Arabian alchemist, ranking as an alchemist among the Arabians equal with Hippocrates as a physician among the Greeks.

Coming on later a great improvement was made in pharmaceutical chemistry during the middle ages by Paracelsus (1493-1541), who was an accomplished alchemist as well as a noted physician and a man of wide travel. Many of the horrible decoctions were modified and improved by him, resulting in the preparations of tinctures. The tincture of opium, called "laudanum," by Paracelsus, has passed down to us.

The celebrated Flemish physician, Von Helmont (1578-1644) was also a distinguished chemist. Boerhaave (1668-1738) the great Dutch physician, was also a chemist and a botanist.

The above named men stand out preeminently in the history of medicine above the common mass of medical men. They were physicians and chemists, originators and producers, epoch makers.

Chemistry became so intimately interwoven in this way with medicine that the two are absolutely inseparable. How else could it be when Materia Medica, ancient, mediaeval and modern is no more than the chemical products drawn from the earth and from the vegetable and animal kingdoms?

The writer is unable to see why a physician should not know something about chemistry in view of the above facts. Ideas of modern physiology have not been discussed, nor has the ability to interpret general medical literature. It seems that there is but one conclusion and that is, if the student of medicine is to obtain an intelligent, thorough understanding of the subject he must know something of the fundamental principles of chemistry.

J. M. K.

## DONATION OF MEDICAL BOOKS.

At the last staff meeting of the *Journal*, the question was brought forward and discussed as to what would be the most practical disposition of the books received by the *Journal* and reviewed by members of the staff, and of the scientific periodicals coming regularly to the offices of the *Journal*, most of them on exchange. After thoroughly covering the possibilities, it was unanimously decided that this literature would serve only a selfish end if kept as *Journal* property, and serve this end in an unsatisfactory manner, in as much as busy offices are not to be thought of as the proper place for a library or for literary work. It was thought that a much broader field of usefulness could be had for this literature, which is the best to be had and is constantly renewed through the courtesy of various publishers and authors, if the profession of the city and county and any visiting physicians could at their leisure and their pleasure make use of this continually renewed information. There was only one feasible plan. On the death of Dr. Richard Douglas his large library was left to two of our confreres, Dr. Perry Bromberg and Dr. W. H. Witt. With almost unparalleled generosity these gentlemen donated this library to the Nashville Academy of Medicine and Davidson County Medical Society, on condition that the library be properly housed.

Then a committee was appointed by the President of the local association to make the necessary arrangements. After a conference with the Board of Trustees of the Carnegie Library of Nashville, space was allowed for the medical library, and the books of Dr. Douglas became the property of the physicians of Nashville and Davidson County. These, added to the considerable number already in their possession, constitute something near 4,000 volumes. They are being indexed according to the Dewey Decimal Classification System, and will shortly be open to the pro-

fession, in fact, just as soon as the numbering and indexing can be finished.

Than to give additional value to this library and to keep it continually up-to-date by donating its literature nothing could serve the wishes of the staff better.

The staff felt assured that no other disposition would be so pleasing to publishers of journals and books and to authors as this, and that they would feel more highly gratified at this than to have these volumes hidden in the dust and darkness of office shelves or passed on to the second-hand dealers.

On putting the question no voice dissented, and this literature is the profession's, in whose interest the *Journal* was established, by whom it is maintained.

W. A. B.

# REPORT OF CASES

## A CASE IN WHICH A PIECE OF STEEL WAS DRIVEN THROUGH THE KNEE JOINT, FRACTURING THE PATELLA AND CUTTING A CHIP OF BONE OUT OF THE EXTERNAL CONDYLE—FUNCTIONAL RESULT PERFECT.

BY GASTON TORRANCE, M.D., BIRMINGHAM, ALA.

O. H. B., white, aged 30, a machinist, on Feb. 14, 1908, was having a piece of six-inch steel shafting cut with a steam hammer: the piece of steel (½x2 inches) used for cutting was broken by the force of the hammer and a portion of it was driven through the left patella, tearing away the lower third and passing through the joint, cutting the posterior capsule of the joint near the upper margin of the articular surface of the external condyle of the femur and chipping out a fragment of the condyle about 2 c. m. square.

He was seen first by Dr. E. C. Rosamond, who applied a sterile dressing without making any attempt to probe or discover the extent of the injuries. I saw him with Dr. Rosamond a few hours later and had him removed to St. Vincent's Hospital for operation.

Under ether the limb was carefully cleansed and the wound irrigated and every precaution used to prevent infection. On opening the wound the above injuries were found, with some clotted blood in the joint; this was removed with the gloved finger and irrigation.

FIGURE 1.—Skiagraph taken the following day after operation. Mechel clips show suture line. Note close approximation of patella fragments. The point beneath the patella indicated by the arrow shows where the chip of bone was removed from the external condyle.

FIG. 2.—Photograph of leg taken ten days after operation, shows normal appearance of the limb and the firm union of the wound.

FIG. 3.—Skiagraph of the knee taken six weeks after operation. Patella shows good union and the cavity in the external condyle has been filled.

The wound in the posterior capsule extended into the cartilage, and in suturing it back a flap of cartilage had to be sutured. A small, curved, round needle with No. 2 chromic catgut was used, and interrupted sutures were passed and tied so that the knots lay in the

FIG. 4.—Photograph taken two months after operation; at this time there was a slight restriction of motion due to adhesions of the scar, this has since cleared up and the joint is apparently perfectly normal.

cavity in the condyle and presented a very small portion of gut on the joint surface. In places the suture was passed through the cartilage of the condyle and through the fragment of cartilage, bringing cartilage to cartilage; on the outer side the sutures were passed and tied in the same manner, having all of the knots external. The capsule beneath the patella was sutured and the fragments coapted and the patella ligament sutured over them, no attempt being made to suture the patella.

A few strands of silk worm gut were placed between the fragments of the patella to drain this space, and a similar drain was placed in the cavity in the condyle, which was so placed as to drain the joint cavity. The skin was closed with Mechel clips. The knee was wrapped in dry, sterile gauze and a posterior splint was snugly applied. The dressing was changed the following day; there was no swelling or distension of the joint and only a small amount of synovial fluid on the dressing. The drains were removed on the third day and the skin clips on the fourth day.

There was never the slightest sign of infection and the wound healed by primary union. There was no pain or discomfort, and he remarked to me on the morning of the seventh day that he thought he could walk home if he were given a cane.

He was removed to his home on the 14th day; the wound was perfectly healed and the joint was normal in appearance and size and was free of tenderness and effusion; the patella was freely movable, and slight manipulation of the joint did not demonstrate any restriction of motion.

A splint made with a hinge was put on at the end of three weeks, which allowed free motion up to a certain limit. This was removed at the end of five weeks, and he was allowed to use the limb with only a firm bandage over the knee. At the end of six weeks flexion was practically normal, and he used the limb as well as before the accident.

After walking on it for several months he says he cannot tell that he has ever had an injury, and every function and motion seems to be perfectly normal.

# ABSTRACTS OF CURRENT LITERATURE

## MEDICINE

### THE DIAGNOSIS OF PANCREATITIS.

(A. J. Ochsner, B. S., F. R. M. S., M. D., Surgery, Gynecology and Obstetrics, December, '08.)

After commending the brilliant work of Mayo-Robson for bringing the pancreas to the proper attention of the surgical profession, he reviews the Cammidge test, and concludes that the test is of value, but needs further development before it can be generally employed.

He says so large a proportion of patients suffering from gallstones and other infections of the billiary tract also suffer from pancreatitis, that the general symptoms of cholecystis should make one suspicious of the probable presence of pancreatitis. The proportion of cases of gallstones complicated by pancreatitis is given from 6 to 30 per cent.

In a case of cholecystitis, if there is a distinct point of tenderness at Mayo-Robson point, half-way between the end of the ninth rib and umbilicus, and a second area of tenderness upon deep pressure for a distance of five to ten centimeters from a point a little to the right of the umbilicus upward over the right rectus muscle, you may safely make a diagnosis of pancreatitis in all cases where duodenal ulcer can be reasonably eliminated. Two symptoms of duodenal ulcer must be absent. First, hyperchlorhydria, with eructations; second, pain before meals when the stomach is empty.

Another common symptom is the pain radiating to the mid-scapular or the left scapular region. This referred pain has been looked upon as indicative of gastric ulcer, but this seems true only when there is also pain upon deep pressure at a point half-way between the ensiform appendix of the sternum and the umbilicus.

Aside from the Cammidge test a number of authors have published other tests which are worthy of further study. Solomon claims that in giving von Noorden's oatmeal diet, patients suffering with pancreatitis have typical butter stools. He also stated that an abnormal large amount of lycethin is found in stools of patients suffering from pancreatitis. When they are placed on an egg diet, 0.4 to 1.2 gms. will be excreted in twenty-four hours, while under the same conditions if the pancreas is normal never more than 0.1 is excreted. Mueller's test is so simple that it must prove valuable if further test will establish its reliability.

The patient is given a test-meal, and two hours later a calomel purge. A few drops of the stool are sterilized by heating to a high temperature, then placed on an ager plate containing Loeffler's serum. This material is kept at a temperature of 131 to 141 degrees F. for twenty-four hours. If trypsim is present the serum shows pronounced depressions where the substance has been active; if inactive, the serum remains smooth.

The diagnosis of acute pancreatitis is extremely difficult, because so many other conditions have similar symptoms. Perforation of gallbladder, duodenum or posterior wall of the pyloris, renal colic, ectopic gestation and appendicitis have all been mistaken.

The pain is terrific in the right upper

quadrant of the abdomen, the patient is severely shocked, nausea and vomiting are present; tympanites develops rapidly, but is more marked in the upper right quadrant. The abdominal muscles are extremely tense. Sugar is sometimes present in the urine. Moynihan has found the muscles not rigid. He also directs attention to the steady rising of the pulse. There is generally an increase of temperature which rises high in the very acute cases. Elliott claims if a tumor mass can be felt, its surface is tympanic because of its location behind the duodenum and pylorus. Opie has observed cyanosis in several cases.

W. M. Mc.C

## TEMPORARY VENTRO-SUSPENSION OF THE UTERUS; ITS TECHNIQUE INDICATIONS AND END RESULTS.

(By Edward H. Ochsner, M. D., Surg., Gyn. and Obstet., Jan., 1909.)

In reviewing the methods adopted for fixing the uterus, Dr. Ochsner says that both ventro-fixation and suspension are almost generally in disfavor because of unpleasant complications which they may produce. His principal objections are:

1. That they may seriously interfere with subsequent pregnancies.

2. That they may be a cause of intestinal obstruction.

3. That more suitable methods have been devised.

4. That he dislikes the idea of fixing organs that are normally movable.

He also says that none of the methods of suspension or shortening of round ligaments have been very satisfactory in preventing the recurrence of retroflexion and reformation of adhesions. He objects to the removal of the uterus in extensive disease of adnexa because of several reasons. Among them are: That it adds to shock; fresh areas are opened up for absorption; the pelvic floor is weakened, and that it is opposed to the principle of conservatism now popular in reference to this organ. Because of the failure of the various methods, he has devised one which he feels is a useful and efficient measure. This method is a temporary suspension to be used in operations for diseased adnexa, such as pelvic abscesses and old extra-uterine pregnancies, or in any condition where a large raw area is left uncovered.

The technique of the operation is: In cases where you think it may be applicable let the skin incision extend down below fascial incision, and this below the peritoneum. Take a needle, armed with a double thread of 10-day catgut and carry it through the left rectus fascia one-half inch below end of incision; then carry through muscle and lastly through peritoneum one inch below end of its incision; the suture is then passed through the uterus one inch behind apex, and taking a good bite, is then carried up through opposite side. This suture is then tied only tight enough to bring uterus in contact with peritoneum, but not tight enough to cause absorption from pressure. Be very careful not to abrade peritoneal surface of uterus. The sigmoid is then placed behind uterus and omentum spread over all raw areas.

He especially emphasizes the point that in all our manipulation we should be very careful not to abrade peritoneum on bowel or omentum, if avoidable, because of the fact that where two raw surfaces come together then firm adhesions take place.

This operation, he believes, holds the uterus forward until most abraded surfaces have healed or have been protected by omentum. This procedure also allows the round ligaments to regain their tone so that later they may act as efficient supports. In this connection he remarks that it has been proven that where the ligaments can not act they soon atrophy, but where they are partially opposed they hypertrophy.

During the last seven years Dr. Ochsner has done this operation many times and has never found afterwards a permanently suspended uterus nor one fallen back and acting as a plug to the pelvic outlet. In a series of 32 cases the uterus was afterwards found movable and in good position and the patients had not suffered with constipation and other symptoms due to pelvic adhesions. In several cases undergoing secondary operations the uterus was found movable, the round ligaments were well developed and performing their function, and in no case was the uterus or omentum found adherent to the abdominal wall. The points which he thinks should recommend this operation are: It has none of the objections attributed to permanent ventro-fixation or ventro-suspension; it is simple and easy of application; it doesn't open up new fields for infection; it doesn't increase shock, it leaves the pelvic organs in as near a normal condition as possible, and apparently it is nearly always effective. J. O.

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## CHANNELS OF ENTRANCE OF TUBERCULOSIS.

(By Dr. Samuel Bernheim, President de "l'Oeuvre la Tuberculose Humaine," Paris. Alienist and Neurologist, Nov., '08.)

Dr. Bernheim, after quoting a large numbe of clinical observations and experiments on animals, reaches the conclusion, contrary to the opinion of Professor Calmette, that this disease is chiefly transmitted by aerial germs, and that they reach the body by way of the respiratory tract.

He summarizes as follows: The clinical data furnished by pathological anatomy and by experiment for half a century confirm the "aerogenic" doctrine of the transmission of human tuberculosis, the respiratory tract being the principal and usual point of entrance of the bacterial contagion.

The great number of cases of tuberculosis contagion by the dry bacilli of Koch incorporated in dry dust and numerous other objects, prove the virulence of this microbe even when it is not carried by a moist vehicle. The great facility of realizing in man as well as in animals an experimental tuberculosis by inhalation, argues in favor of the view that the respiratory tract is a common channel of infection.

The intestine as a door of entrance is possible, but is far from being the normal and usual one. The frequency of tuberculosis in countries where the use of meat and milk is very limited, the slight mortality of children by tuberculosis during the period of lactation, demonstrate that their intestines play a role altogether secondary, though appreciable, as a channel of entrance of tuberculosis. Moreover, large doses of tuberculous products are necessary to produce experimental tuberculosis by this route, and failures are frequent.

The bacillary heredity of tuberculosis does not exist; exceptionally it may result from contagion in utero, but this cannot be considered as an important factor in the contagion.

The hereditary predisposition must be rejected, for infection in this way is in relation with the degree of "contagiosity" of the environment which produces phthisis, and with the frequency of contaminations.

The vascular path is rare as a channel of entrance of Koch's bacillus, and it is very difficult to demonstrate its importance.

The genital tract must be considered as a factor, and clinical observations and experiments demonstrate that this channel of entrance is not as rare as has been supposed.

The anal orifice may serve as a channel of infection under the same conditions as the skin and mucous membranes, but is not a factor of the first importance.

The buccal mucous membrane in children must be considered as a possible door of entrance for cervical tuberculosis. R. L. J.

Prof. Gaucher reports, July 11, 1908, in the *Lancet:* A man, 45 years of age, entered the hospital on March 22, 1907, with all the symptoms of tabes. Twenty years previously he had contracted syphilis. Injections were given daily of 0.02cg 13-1000 gr. of mercury benzoate.

In August he ceased to attend, but returned on Jan. 23, 1908, with severe mercurial stomatitis. He could open his mouth with difficulty, the tongue was swollen and the mucous membrane of the mouth was turgid, ulcerated and covered with saliva, which flowed away continually.

He had been treated for two months in another hospital and had been given nine injecton of gray oil. After the seventh the gums became painful and the pain increased after the eighth. Nevertheless, the ninth injection was given. The injections were properly administered, and there was no albuminuria. The tabetic symptoms were scarcely affected. Frequent lavage of the mouth with oxygenated water, painting the ulcers with tincture of iodine and iodotannic syrup internally were prescribed. The stomatitis improved a little, but suddenly on Feb. 11 it assumed its former severity. A gram of potassium iodide was prescribed daily on the following day, when the inflammation was reduced a little. A grayish, gangrenous ulcer could be seen on the mucous membrane of the right cheek, which extended on one side to the gum and border of the tongue and on the other to the palate. In position of the molar teeth, which were absent, was a grayish sequestrum of the inferior maxilla. On the right submaxillary region was a hard swelling, which extended on the external surface of the jaw. The urine contained a trace of albumin and a very small quantity of mercury. The presence of the latter, more than a month after the cessation of the injections, showed that there was still a source of intoxication. In the right buttock a nodule was found, which evidently contained a supply of mercury.

On the 27th this was removed and the submaxillary swelling was incised, which caused the escape of serosanguineous fluid from the edematous tissue. The incision was drained; slow improvement followed. On March 25 and 26 two large sequestra were removed with forceps.

Prof. Gaucher pointed out the special danger of injections of gray oil as compared with injections of more soluable preparations. The mercury might accumulate and then suddenly undergo absorption with disastrous results.

E. C. DEM.

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## SURGERY

### THE SPOHN SPLINT FOR FRACTURED CLAVICLE IN CHILDREN.

(By J. A. Bodine, M. D., in *N. Y. Polyclinic Journal,* November, 1908.)

There is no retentive dressing or splint yet devised that prevents deformity in all cases of fractured clavicle. On the contrary, deformity is the rule, no matter what the care of the surgeon or character of splint used.

The Spohn splint is efficient in preventing deformity, and comfortable in its application to the patient if its use is confined to children up to five or six years. It is not recommended for complete fractures with typical displacement in adults. Its simplicity and ease of construction will appeal to the surgical mind; —a segment of sugar—or flour-barrel hoop, in length slightly more than the width across the chest between the two deltoid prominences; a piece of soft pine, whittled approximately to a hemisphere two inches in diameter, nailed

to each end. The nail is driven through the splint into the flat surface of the pine hemisphere only sufficient to hold them together, the nail head left projecting. The splint is softened in very hot water, and after reduction of the fracture by forcing the shoulder upward and backward, the splint is fitted into and between the "hollow of the shoulders," and confined by a simple figure-of-eight bandage. Each turn of the bandage as it passes in front of the shoulder is perforated and retained by the projecting nail-head. It surely is very simple, which is the highest surgical recommendation, if it is efficient. Should the surgeon so desire, the splint could be made of springy metal, such as polished steel, and with a sliding screw, lengthened or shortened to fit any child. G. C. T.

## PARATHYROID TUMORS.

(With Report of a Case, by J. Chalmers Da Costa, M. D., in Surgery, Gynecology and Obstetrics, January, 1909.)

Dr. Da Costa remarks upon the rarity of parathyroid tumors and the brief mention given the subject, even in the latest text-books, by men who have best opportunity of meeting such a condition. Reviewing the reported cases, he has been able to find only seven, his own making the eighth. Of these, three were removed at operation with the idea that they were tumors of the thyroid. In one of these, the tumor was said to be in a state of cystic degeneration. In one it was merely stated that the tumor was parathyroid. In his own case it was doubtful whether the tumor was an adenoma or whether it was due to work hypertrophy. All three cases recovered.

The other five cases were found on autopsy. No mention was made of the nature of one of these, and of the other four there was an uncertainty as to whether they were true adenomas or enlarged glands due to work hypertrophy.

His own case was in a woman 32 years of age. The history of the presence of the tumor dated back six years, having first been noticed after an attack of suppurative inflammation of the tonsils. For the four first years the growth had been slow and gradual, but during the two latter it had been more rapid. There had never been any pain, but at times there had been a sense of choking. For three years there had been present an irritating cough. On admission to the hospital, the patient was thin, neurotic and in poor general health.

On physical examination there was found no pathological condition in the heart, lungs, kidneys, or blood. But upon the right side of the neck was found a tumor, which was as large as an orange, was overlapped by the sterno-mastoid muscle, and was firm in consistency. It moved with the trachea on swallowing, but was otherwise immovable. A diagnosis of adenomatous goitre was made, and the mass removed under cocaine anesthesia. On microscopical examination it was shown to be parathyroid with a small nodule of thyroid attached.

The patient was perfectly well for some time after operation. About one year later she noticed a beginning enlargement upon the left side of neck. Whether this enlargement is from the parathyroid or thyroid, Dr. Da Costa is unable to say. The patient presents no nervous symptoms. Without other reason than the presence of the tumor, Dr. Da Costa is unwilling to operate, fearing the bad effects which might follow removal of too much parathyroid tissue.

J. O.

## EYE, EAR, NOSE AND THROAT

Futher report of the progress of Experiments with the lactic acid bacilli and exhibition of cases. By H. Holbrook Curtis, M.D., before the New York Academy of Medicine. "Laryngoscope," December, 1908.

In the New York Medical Record of July 11 of this year I reported the results obtained by injecting the nasal cavity with the lactic-acid secreting bacillus of Massol, which Metchnikoff employed in his experiments upon the nasal tract.

In that paper I reported but seven cases with results which were surprisingly good. I advanced, however, a very guarded statement at that time, and preferred to wait until further experience justified a more positive claim as to the real efficacy of the culture. Today I unhesitatingly claim that it is the best means we have at our command in combating that most distressing disease ozena, accompanied by crust formation, and for the topical treatment of suppurative disease of the ethmoid cells and frontal sinuses.

I will show you tonight a typical case of six ozena patients treated with equal success and a chronic double frontal sinus case which I have relieved by this method. This case is also one of six cases which have shown remarkable results from the culture injections. I exhibit a syringe and catheter used for injection of the naso frontal duct, a means employed as an adjunct to the ordinary spray application of the culture.

Not only does the culture act on the pathogenic bacilli in the nasal and accessory cavities, but the active solution contains a product which has a pronounced effect upon the vasomotor system of the nose. Turgescent hypertrophies seem to disappear; œdematous conditions, resulting from hay fever, subside, and its effect on the swollen membrane in the first stages of a coryza is often very remarkable. These phenomena can hardly be attributed to lactic acid nor to the bacilli themselves, but to some agent in the culture solution, the identification of which has as yet not been determined.

Another case I present is a lady who has been under my care for some years with a chronic suppurative otitis media. The right ear has been the offending member, but the discharge has been controlled by packing the tympanum with a ten per cent pyoctannin and boric acid powder whenever it becomes active, which event occurs about once a year. Two weeks ago the left ear, which had been quiescent for several years, suddenly became active and a suppuration with carious odor commenced. I inflated the Eustachian tube and injected through the catheter some culture broth, and dropped the same into the ear. Some pain was complained of shortly after the instillation, but to my surprise the discharge was checked in two applications. I will say, however, that this has not been the result in every case I have experimented on with the bacilli. In antrum cases where injections have been made through the natural orifice, as a rule my results have been unsatisfactory.

If in no other cases than in ozena had one experienced great relief, we might still welcome the product produced by the Lederle laboratory as of inestimable value.

The laboratory extended to me the privilege of making the clinical investigations of the bacilli, but the widespread interest evoked by the original article, which I quoted above, has made the classification of data from widely separated observers too arduous a task for any one in active professional work, so in future the statistics from all sources will be compiled by Dr. Charles E. North, of the laboratory staff, who has perfected the bacteriological processes of manufacture, and to whom credit for the initial experiment belongs.

Case 1.—The case of ozena presented the following history: M. T. Aet. 35, has had ozena and crusts for eighteen years. He has been treated by several specialists. His home treatment has consisted in snuffing salt solution from a tumbler and removal of the crusts, following this with an antiseptic spray.

On Oct. 6 he was referred to me by Dr Robert Wheeler of Brooklyn. I found his nasal mucous membrane excoriated in places and the cavities filled with a grumous mass of detritus, with pus on the surfaces in contract with the walls. His general health was greatly undermined. He suffered from constant nausea, indigestion, progressive emaciation, dizziness, headache, great weakness and inability to apply his mind to his work. A confused feeling at times was relieved by clearing out his nose.

After clearing out his nasal fossae and syringing with normal salt solution, I made a spray application with the lacto bacilli culture. After the first injection there was a marked relief in both nose and throat. After the second injection the purulent character of the postnasal discharge underwent a great change. The hawking and choking stopped, and with the disappearance of the crusts, the purulent discharge has been daily becoming more transparent. After six injections the patient states that he is perfectly comfortable, and estimates that his trouble has diminished more than 90 per cent.

Case No. 2.—Mr. J. F. For eighteen years this patient has had a very profuse discharge of pus from the nasal cavities, dropping into the throat during the night. His sleep was much disturbed.

For the past five years there has been more or less pain over both frontal sinuses. I operated upon the anterior tip of the right middle turbinate and curetted the anterior ethmoid cells two years ago. I was enabled to syringe the sinus by means of the catheter, and relieved the discharge somewhat, but pain continued. During the past winter patient has suffered intensely after mental exertion, and has been unable to leave the house at night.

In June last I cleansed both nostrils and injected both frontal sinuses as well as I could and sprayed the nasal vault with a fresh culture. After the first injection the discharge assumed a very different aspect, becoming thinner and more transparent. After the sixth injection at intervals of two days, the pain and discharge entirely ceased.

A few days ago, after a severe cold, there was some pain and a slight discharge from the left frontal sinus. This, however, was relieved upon the second injection of the bacillus culture. I consider the condition at present to be normal, and the patient considers himself cured. M. M. C.

## DERMATOLOGY

### MODERN DERMATOLOGICAL PATHOLOGY AND ITS RELATION TO THERAPEUTICS.

By Charles J. White, *Journal of Cutaneous Diseases,* November, 1908, p. 490.

White states that the pathological knowledge of cutaneous diseases has increased greatly in the last twenty years on account of our improved histological technique, our deeper understanding of bio-chemical reactions, and the universal participation of dermatologists in pathological investigations. We have very complete histological data concerning every recognized dermatosis.

He enumerates the diseases located in the different layers of the skin as arranged by Darier, and refers to the older classification of Hebra. In the recent past the chief methods

of using remedies for the skin have been by internal and external means, and these remedies are discussed briefly.

For the last ten or fifteen years the practice of dermatology has advanced pari passu with all other human activities. New remedies have been discovered and new methods devised, which are discussed under the following headings: 1. New Drugs. 2. Radiotheraphy. 3. Electrotherapy. 4. Actino-theraphy. 5. Hydrotheraphy. 6. Organotheraphy. 7. Psycotheraphy. 8. Congelation. 9. Hyperæmia. 10. Serum and vaccine theraphy.

(Two or three pages are devoted to each heading, and the essay is too long to abstract in detail. All interested in dermatology should read the original.) J. M. K.

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## OBSERVATIONS ON THE USE OF LIQUID CARBON DIOXIDE.

By Joseph Zeisler, *Journal of Cutaneous Diseases, January,* 1909, p. 34.

He says that while Pusey in his original communication recommended carbon dioxide snow in a very modest way for the removal naevi and warts, and Dade and Whitehouse applied liquid air for the same purpose, it occurred to him that carbon dioxide had a range of usefulness far beyond mere cosmetic purpose, and with that idea in mind he began his work.

He elsewhere describes the technique, but adds that the snow can be conveniently molded in an ear speculum. In its use the amount of pressure exerted and the time of application are the two main factors. As routine practice, make enough pressure to cause within a second or two a moderate depression of the frozen area below the level of the skin. The time should depend upon the intensity of the effect desired, as, for instance, a superficial lesion can be destroyed in from five to ten seconds, while one minute may be required for deeper lesions. Notwithstanding very energetic freezing, the final result is always satisfactory as far as the scar and cosmetic condition of the skin is concerned.

The painlessness, the rapidity of the work, the avoidance of an open wound and the satisfactory cosmetic effect, make carbon dioxide the most elegant and the safest of all destructive agents. The effect varies with the time of exposure, from a simple erythema to necrosis. A blister will form as a rule after five or ten seconds, a raw surface follows with a serous exudate and a slight swelling of the surrounding tissues.

He has used it in lupus erythematosus—six cases—with such satisfaction that he considers it superior to any other known treatment. He has also used it in thirteen cases of superficial epithelioma with good results.

J. M. K.

# BOOKS

## RECEIVED

*Surgery.* By John Allan Wyeth, M.D., LL.D. (University of Alabama), President of the New York Academy of Medicine. 864 Illustrations; 816 pages Price, $7. Marion Sims Wyeth & Co., Publishers, New York, N. Y.

*Surgery of the Upper Abdomen,* by Deaver and Ashhurst. Vol. 1; with 76 Illustrations; 460 pages. Price, $5. P. Blakiston's Son & Co., Philadelphia.

*The Urine, and Clinical Chemistry of the Gastric Contents. the Common Poisons, and Milk.* By J. W. Holland, M.D. Forty Illustrations; eighth Edition, Revised and Enlarged. Price, $1. P. Blakiston's Son & Co., Philadelphia.

*Practical Bacteriology, Blood Work and Animal Parasitology.* By E. R. Stitt, A.B., Ph.G., M.D. 294 pages; 86 Illustrations. Price, $1.50. P. Blakiston's Son & Co., Philadelphia.

*Mind and Its Disorders.* By W. H. B. Stoddart, M. D., F.R.C.P. 488 pages; Illustrated. Price, $4. P. Blakiston's Son & Co., Philadelphia.

*Marriage and Disease.* Edited by Prof. H. Senator and Dr. S. Kaminer, Berlin. Translated from the German by J. Dulberg, M.D., Manchester, England. Price, $2.50. Paul B. Hoeber, New York, N. Y.

## REVIEWED

*Modern Physio-Therapy.* A System of Drugless Therapeutic Methods. (Including Chapters on X-Ray Diagnosis and Suggestion.) By Otto Juettner, A.M., M.D. Cincinnati Medical Book Company, Cincinnati, Ohio.

This work, now in its third edition, is offered to an all-suffering profession by its author, with an apology in its preface and much worthless poetry in its body. It purposes to deal with physiological and with physical methods of therapeutics, while in fact it seems to the reader to be rather an enlarged almanac of Battle Creek methods, plus an abiding faith in the positive and negative poles of an electric battery. It discusses, according to the author, the entire field of clinical medicine, which may be readily understood when we consider that the subjects of Gastric Cancer, Gastric Ulcer and Gastritis are covered in less than one and one-half pages; Granulated Eyelids, seventeen lines; Headache, six lines—viz.: Symptomatic relief can be obtained from pressure over back of neck and head, pressure over temples and forehead, suggestion of sleep, positive static crown breeze.

From the above the reader is unable to determine whether the author is an osteopath, a Christian Scientist—or possibly its just a joke. The book is full of such nonsense and is unworthy of the consideration of any scientific student. P. B.

*Diseases of the Genito-Urinary Organs and the Kidneys.* By Robert Holmes Greene, A. M., M.D., and Harlow Brooks, M.D. W. B. Saunders Company, Philadelphia.

This work offers to the student of medicine as well as the specialist in this department a complete library of known and recognized facts. The authors may well feel proud of their results, for they have unquestionably contributed a lasting work upon this subject—one which, in the opinion of the reader, will not only displace other valuable works as text-books in many medical colleges, but will remain for a long time the leading book on kidney and genito-urinary diseases. It is not intended solely as a text-book; for the arrangement of the subject matter, so capably handled, makes it invaluable to the general practitioner as well.

The work begins with a chapter devoted

solely to methods of examination, and is complete and full, holding the attention of the reader to the minutest detail. Chapter 2 is devoted to endoscopy, cystoscopy and ureteral catheterization, all of which are fully discussed and well illustrated, while the methods of determinating the functionating capacity of the kidney are mentioned, and those proving practical are considered in detail, while those of impractical value or unsuitable for general work are not exhaustively considered. Chapter 3 deals with the care of urethral instruments and the preparation of the patient and the surgeon for operation. This chapter is not as exhaustive as it might be, nevertheless it serves every purpose, and will be found sufficiently clear even to those not thoroughly drilled in aseptic surgery.

Chapter 4 deals with the examination of the urine and urethral exudate, including microscopical methods for the urinary examination, as well as the seminal and prostatic secretions, together with the methods of examination for the spirochæta pallida.

Having devoted the first four chapters in the orderly detail above noted, the authors pass to the consideration of the kidney; its embryology, anatomy and physiology, to which chapter 5 is devoted, including a thorough presentation of the subject of compensation in renal disease.

Chapter 6, dealing with the blood in diseases of the kidney, together with a consideration of blood pressure in renal disease, is in keeping with other parts mentioned—thoroughly up to date.

Chatper 7, on the ocular manifestations of renal disease, written by Dr. Richard Kalish, is entirely too condensed, and in no way compares with the more exhaustive handling of this subject given in other text-books on diseases of the kidney.

Chapter 8 to 19 deals are devoted to diseases of the kidney and ureter and are splendidly written.

Chapters 19 and 20 deal comprehensively with the anatomy, physiology and diseases of the bladder.

Chapters 21, 22, 23 and 24 dealing with the anatomy, physiology, diseases and deformities of the male and female urethra, with their treatment, are capably handled, well illustrated and thoroughly modern.

Chapters 25 to 28 devoted to the seminal vesicals and prostate, are beautifully illustrated and splendidly written. The testicle and epididymis are treated in the remaining chapters, and the treatise closes with a chapter on the sexual neuroses.

It is, taken as a whole, a pretentious volume, and I regret that this notice does it such indifferent justice. P. B.

# ELETROTHERAPHY

*By WILLIAM MEYER, Electrical Engineer.*

In the December issue of this Journal appears an interesting article on "Larval Tapeworm in Human Flesh." Dr. H. Gates in making his examination finds that "This infection is not on the body where exposed to sun-light," and asks "Would that be a suggestion for the X-ray treatment?"

The X-light is diametrically opposed to sunlight and it is very questionable to my mind if the X-ray will give the swift and certain results obtained with a THERAPEUTIC LAMP. Such a lamp has a much larger volume of efficient rays than the most powerful X-ray tube, and for the treatment of skin lesions and even necrosis of the bone, the results have been more certain. Acme, eczema, lupus, respond readily to such treatment. For reaching the the deeper parts the Therapeutic Lamp should have a lamp bulb of about 100 candle power, the filament being concentrated into one close coil, to make the light intense. This lamp which radiates 100 c.p. in every direction, when placed within a parabolic projector of ample size, will gather all lightrays and project them in one direction, increasing the light in this one direction to about 300 c.p. Being projected into space in a certain direction these light waves have a high velocity and are the nearest approach to actual sunlight. They will be found to give immediate relief in accute pain. I have clinical evidence of its value in a case of sepsis following mastoid operation, where the patient was told everything had been done, and he had a bare fighting chance.

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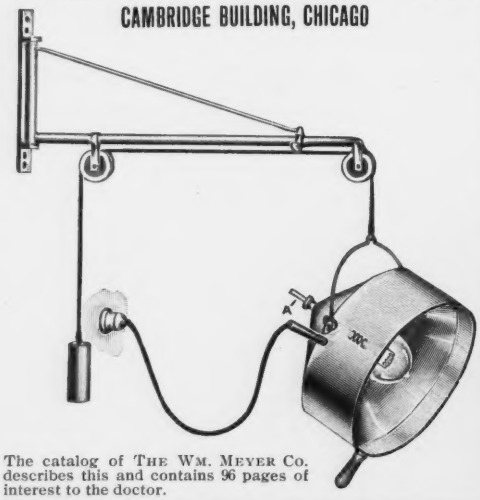

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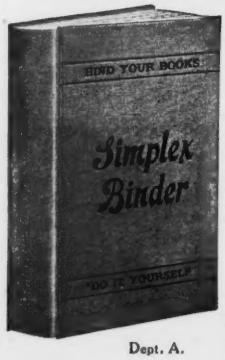


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